

A NEW
THEORY OF
HUMAN
EVOLUTION

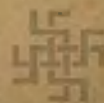
SIR
ARTHUR KEITH



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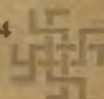
A NEW THEORY OF HUMAN EVOLUTION

BY
SIR ARTHUR KEITH

LONDON

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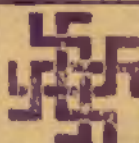
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Indira Gandhi National Centre for the Arts

PREFACE

ALMOST seventy-six years ago—on February 24, 1871, to be exact—Darwin published *The Descent of Man*, and so laid the foundation of our modern knowledge of man's origin. I grew up with the book and when a medical student became, as did so many of my contemporaries, an ardent Darwinist. *The Descent of Man* came of age in 1892, but three years before that I had begun to apply myself to the dissection of anthropoid apes and of monkeys—the forms of life which were deemed most akin to man in structure. I became as much interested in the structural relation of one ape to another as in their combined relationship to the structure of man. For wellnigh a score of years I pursued my inquiries into the anatomy of man and ape, but after 1908 I became interested in the much more important problem: in what circumstances and by what means were the body and the brain of an ape transformed into those of a human being? When and where did this transformation take place? To permit such an evolutionary change to happen I conceived that two conditions were essential: first, that the Primates which were to undergo the change must have formed a social group; second, that the group must have been separated or isolated from all neighbouring groups. I was by no means the first to perceive that isolation was an essential condition of group evolution, but I think I was the first to detect the means by which such isolation was secured. My predecessors attributed isolation to physical barriers—to mountain ranges, to wide seas, and to impassable deserts—whereas I found the “machinery of isolation” to be resident in the mentality of ape and of man. When that idea came to me, I found I was in a position to solve many problems in human evolution which had formerly puzzled me.

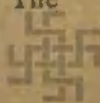
From 1908 until the time at which I write (1947) not a year has passed without bringing “grist to my mill.” Somewhere someone has discovered a fact, or conceived an idea, which cast a new light on the means and manner by which man had made his



ascent. One year it was the discovery of fossil remains of man or of ape; another brought us more exact methods of dating the antiquity of such fossils. Our knowledge of the embryology of man and ape steadily advanced; our information concerning the mentality and habits of apes and of men has gone on increasing; our understanding of the manner in which the germinal inheritance of one generation is handed on to the next has grown ever more precise; the mode in which functional and structural changes were brought about became more apparent; and tidings of how primitive peoples live came steadily in from the most distant lands. In all of these ways new light has been, and is being, thrown on the problem of human origins. These forty years I have been standing, as it were, at the receipt of custom and, while pursuing my own inquiries, have gathered into my portfolios each fact or idea as it came along in the hope of gaining materials from which I might fashion a more precise theory of man's evolution. This book represents the harvest of a lifetime. I have bound my harvest into sheaves, for each essay represents a sheaf. And my sheaves, when built together, form a rick or theory; not a completed one I admit, but yet nearer completion than any that have gone before.

The appearance of *A New Theory of Human Evolution* was heralded in the volume of essays I published in 1946 under the title *Essays on Human Evolution*. In the preface to that volume I wrote :—

“ There are three main themes on which I believe I can throw light. The first theme relates to the manner in which the final stages of man's evolution or ascent was accomplished. Most anthropologists conceive a sort of Jacob's ladder up which mankind has ascended, rung upon rung, to reach his present estate; whereas I am convinced that the evidence is now sufficient to permit us to draw a reliable and circumstantial picture of the conditions in which mankind lived while its major evolutionary changes were taking place. My second theme relates to the current conception of Race and Nation. Most of my colleagues regard a nation as a political unit, with which anthropologists have no concern; whereas I regard a nation as an ‘ evolutionary unit,’ with which anthropologists ought to be greatly concerned. The



only live races in Europe to-day are its nations. My third theme relates to war—"the greatest evil of the modern world."

"The natural order in which my three themes should have been handled was to give first an exposition of my theory of human evolution; then to trace the origin of nations, of races, and of the varieties and sub-species of mankind; and lastly to deal with the origin of man's morality and of war."

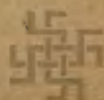
My preface then goes on to explain how I was tempted to reverse the "natural order" of my exposition and to deal first with the rise of man's morality, of his immorality, and to trace the scourge of war to its evolutionary roots. In this present volume I take up my other main themes—my theory of man's evolution, the demarcation of mankind into its major divisions or varieties, the role played by "race" in evolution and the rise of nations. My previous volume was a superstructure; the present volume is an exposition of the fundamentals on which that superstructure is based.

Readers and critics, having looked at the first essay, in which my theory is outlined, having glanced at the synopses which preface each essay, and having read the summary given in the last essay may be moved to say: Why, this is not a new theory; it is simply Darwin's theory extended, modified, and brought up to date! With such a verdict I will not quarrel; the foundation on which I have built is that laid by Darwin. But the theory of human evolution expounded in my text differs in so many things, both great and small, from that outlined in *The Descent of Man*, that I think it is entitled to be called "new." At least it is a new rendering of the Darwinian theory.

In a work of this kind an author becomes indebted to hundreds of men, both living and dead. I have tried to be just to them in all my borrowings. I take this opportunity of acknowledging my great indebtedness to Mrs. Rupert Willis for the help she has given me in clarifying my text, and to Miss Gwen Williams for re-typing my original script.

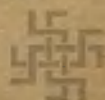
ARTHUR KEITH.

Downe, Kent,
February 8, 1947.

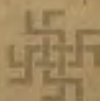


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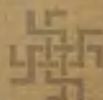
ESSAY I

A SUMMARY OF THE NEW OR GROUP THEORY

Synopsis.—Circumstances which led the author to formulate the "Group" Theory of Human Evolution. Hormones as part of the machinery of evolution. A search for the factors which prevent the swamping of new characters when they first appear. Such factors are found in the separate grouping of primitive peoples. A mosaic grouping was in existence among the higher Primates before the emergence of man's simian ancestry. Evolutionary units defined. The growth of such units from local groups to tribes, and from tribes to nations. A great number of small competing units favour rapid evolutionary changes. The original grouping was determined by territory, not by kinship. How evolutionary units are kept apart. The importance of a sense of community. The group theory assumes that in all stages of human evolution co-operation has been combined with competition. The behaviour of evolutionary units has always been based on a twofold code of morality. Such a code favours the rise of the "bad" as well as of the "good" components of human nature. Human nature is a product of evolution and is also concerned in the process of evolution. Extensive migratory movements belong to a late phase of human history.

LET me begin this essay by recounting the circumstances which led me to formulate a new scheme of human evolution to which I have given the provisional name of "Group" Theory.* In 1908, when I had entered my forty-third year, I was placed in charge of the vast treasury of things housed in the Museum of the Royal College of Surgeons of England. Up to that time I had

* In the first draft of this book I used the term "Mosaic" to designate my theory because it involved a closely-set mosaic of competing groups or tribes. Later I realized that it was not the closely-set arrangement of groups that was the essential point of my theory, but the existence of separate competing units or groups. Hence the name "Group" Theory. Readers will find in my text traces of the name I used in the first draft.



occupied myself with an anatomical exploration of the bodies of man and ape with a view to determining the structural relationship of the one to the other. Soon after taking office at the College of Surgeons there was a shift in the main object of my inquiries; my chief interest became centred, not in the structural resemblances and differences between man and ape, but in the problem of how the many species of ape, and, in particular, the various races of mankind, had come by the forms in which we now find them. In short, I found myself in pursuit of what, in crude terms, may be described as the "machinery of human evolution."

At the time of which I write a fundamental addition was being made to our knowledge of the machinery of evolution by the discovery of substances to which Starling had given the name "hormones."¹ These substances, formed in the organs of the living body and circulating with the blood, served not only to harmonize the several functions of the body but, as Starling inferred, to co-ordinate the development and growth of the organs and regions of the body, and so determine their form and features. To obtain a knowledge of the part played by hormones in the shaping of the human head and body, I applied myself to a close study of those disorders of growth which, we had reason to believe, were due to derangements of the hormone system—the Surgeons' museum being particularly rich in examples of such disorders.

I made a close study of the structural changes effected by an abnormal activity of the hormones emanating from the pituitary gland, as exemplified in the bodies of men and women who had become the subjects of that disorder of growth then known as acromegaly.² I noted with interest that in the skulls of such subjects all the features which were overgrown were just those which found such a robust development in the fossil skulls of an extinct race—the Neanderthal race of Europe. It was therefore possible to explain many of the cranial features of Neanderthal man as being due to a vigorous action on the part of his pituitary system. From the study of the dead I passed to that of the living. I came across families which manifested by their large frames and exaggerated features of face a dominance of their pituitaries; I noted, too, that such features often passed from parent to child.

When I proceeded to speculate on how a new race could be

fashioned out of such families I came up against what, at first sight, seemed to be an insurmountable difficulty. These families married into other families, thus scattering abroad their genetic inheritance—their genes; outside marriages brought fresh genes among them. A new race could be fashioned only if such families lived in a small isolated community, inside which all marriages must be contracted. I, therefore, set out in search of such small isolated communities in the modern world, and found that they were still in existence in those parts of the earth which are inhabited by primitive peoples. The evidence gleaned while on this inquiry into the grouping of primitive peoples convinced me that during the whole period of human evolution mankind had been divided into a vast number of isolated local communities, each inhabiting a delimited area or territory. I made the results of this inquiry the subject of the address I gave to the Royal Anthropological Institute, as its President, at the close of 1915.³ My main thesis was that right down to the dawn of civilization the habitable earth formed a mosaic of separated territories and of peoples, and that such a grouping favoured rapid evolutionary change.

Seeing that the apes which show a structural affinity to man are divided into local groups or communities, we may presume that the mosaic pattern was already in existence when the simian ancestry of man began to spread abroad on the earth. The area of distribution was extended by older, successful local groups giving off broods which formed new groups or communities. The size of a local group depended on the natural fertility of its territory; in primitive peoples which still retain the original mosaic form a local group varies from fifty to 150 individuals—men, women, and children. Such local, inbreeding, competitive groups I shall speak of as “evolutionary units”; they represent the original teams which were involved in the inter-group struggle for survival. I am assuming that the earliest forms of humanity were already organized on a mosaic pattern when the human brain reached that stage of development which made speech possible. Far from speech tending to break down the barriers between local groups, it had an opposite effect, for we know that speech changes quickly when primitive peoples become separated.

Throughout the later stages of human evolution the tendency

has always been towards the production of larger and more powerful evolutionary units. In the continent of Australia, for example, where the native population has always been dependent on the natural produce of its territories, there remain only a few regions where local groups persist as separate evolutionary units; ⁴ in the greater part of the continent local groups have become federated into large, isolated, inbreeding, evolutionary units, or tribes. Tribes represent a second step in the production of evolutionary units. In Africa, south of the Sahara, all stages in the growth of units are still to be found, from the local groups of Bushmen to large tribal federations, groups under chiefs or kings. The evidence from the New World corroborates that which has been cited from Africa; in pre-Spanish times every stage in the development of evolutionary units was represented; in the extreme south local groups still persisted among the Fuegians; in North America, among the Iroquois, for example, large tribal federations had come into being; in Mexico, and particularly in Peru, tribal grouping had almost reached a third stage, the national.

The conversion of tribal evolutionary units into the still more powerful national units belongs to a late stage of human evolution; indeed, national concentrations became possible only after agriculture and allied arts had made some degree of progress. When the written records of Europe begin, we find that continent divided into a multitude of tribal territories, many of which were of large size, and long before the end of the first millennium B.C. the process of tribal fusion and federation had made considerable headway. I shall not stay now to discuss the feudal stage which intervened between the tribal and national stages in many parts of Europe, because the question which is uppermost in my mind is this: When does a tribal unit become a national unit? It is when tribesmen forget their former loyalties and become conscious of being sharers in, and individual workers for, the common destiny of their new or national unit. Thus the group theory assumes that during the earlier stages of human evolution Nature's competing teams were represented by small, local evolutionary units; later the local units became fused into larger or tribal units; by the fusion and disintegration of tribal units national units came into existence.

In a later essay I shall discuss the effects which an increase in

the size of a unit brings about in the rate of evolutionary change; meantime I may say that my main conclusion is that evolutionary change proceeds most quickly when the competing units are small in size and of great number. Such evidence as is afforded by the fossil remains of men who lived during the Pleistocene Age—the latest of geological periods, the duration of which is estimated at 500,000–600,000 years—suggests rapid structural changes. At the beginning of that period we find the poor-brained fossil men of Java and of China, while towards the end of that period we can instance the rich-brained Cro-Magnon type of Europe.

Many anthropologists hold the opinion that the original grouping of mankind was by kinship, and that it was only when such groups settled on the land that the demarcation became territorial. My inquiries of 1915 left me in no doubt that a territorial group was primary; every one of the units I have specified—local communities, tribes, and nations—inhabited and claimed the sole ownership of a demarcated tract of country; all were bound to their homeland by a strong affection; and life was willingly sacrificed to maintain its integrity. I therefore came to regard the territorial sense—a conscious ownership of the homeland, one charged with a deep emotion—as a highly important factor in human evolution. Every such territory serves as an evolutionary cradle. In assigning priority to kinship, authorities have been misled by the exceptional case of the Children of Israel. They emerged from the desert divided into twelve tribes grouped according to kinship; only after their arrival in Palestine did they become territorial. Among the great people of modern times the only ones known to me who succeed in maintaining their identity without the aid of a territorial bond are the Jews. (See Essays XXXVII–XXXVIII.)

A sense of territory helps to keep primitive communities apart; and when we dig into human nature we find a more potent machinery to secure the isolation of such communities. My gropings of 1915 led me to believe that the chief factors in securing isolation were (a) clannishness, a mental state which impels us to favour our kind and to be indifferent or averse to all outside our kind; and (b) the state of mind which Giddings⁵ had named the “consciousness of kind.” It is the latter factor that I would now emphasize, only I would speak, not of consciousness of kind, but of consciousness of community. Among

primitive peoples the range of sympathy is confined to their own community. Local communities, our primary social units, being small, every face in them was known to members, strangers being immediately detected and their presence resented. This consciousness of kind, this community sense, is a character not only of human social groups but of all animal societies whatsoever, be they ant or be they ape. On the other hand, a knowledge of blood relationship has been attained by man only, and could not have been reached until the human brain began to manifest its high faculties.

The group theory assumes that the social organization and mentality still displayed by primitive peoples were those which regulated the conduct of evolving groups of humanity in past geological ages. If this assumption is permitted, then we can give a reasonable explanation of how human races arose; if it is rejected, then we can neither explain the origin of humanity as it now is, nor can we understand the strange duality of man's mentality.

The process which secures the evolution of an isolated group of humanity is a combination of two principles which at first sight seem incompatible—namely, co-operation with competition. So far as concerns the internal affairs of a local group, the warm emotional spirit of amity, sympathy, loyalty, and of mutual help prevails; but so far as concerns external affairs—its attitude towards surrounding groups—an opposite spirit is dominant: one of antagonism, of suspicion, distrust, contempt, or of open enmity. The spirit of co-operation helps to strengthen the social bonds of a group; the spirit of antagonism not only secures the isolation of the group but compels it to maintain its powers of defence and, if the group is to extend its dominion, its powers of offence.

In brief, I hold that from the very beginning of human evolution the conduct of every local group was regulated by two codes of morality, distinguished by Herbert Spencer as the "code of amity" and the "code of enmity."⁶ There were thus exposed to "natural selection" two opposing aspects of man's mental nature. The code of amity favoured the growth and ripening of all those qualities of human nature which find universal approval—friendliness, goodwill, love, altruism, idealism, faith, hope, charity, humility, and self-sacrifice—all the Christian

virtues. Under the code of enmity arose those qualities which are condemned by all civilized minds—emulation, envy, the competitive spirit, deceit, intrigue, hate, anger, ferocity, and enmity. How the neural basis of such qualities, both good and bad, came into existence during the progressive development of the human brain, we do not know, but it is clear that the chances of survival of a struggling, evolving group would be strengthened by both sets of qualities. These two sets of opposite qualities must be balanced to secure continuous, progressive evolutionary changes; an over-development of the elements which subserve the code of amity would make its group vulnerable to its enemies; an overgrowth of those which support the code of enmity would lead ultimately to the destruction of the group.

It will thus be seen that I look on the duality of human nature as an essential part of the machinery of human evolution. It is the corner-stone of my mosaic edifice. Human nature is both a product and a process. It has been built up as a product of man's evolution, but it has been developed so as to serve in the process of evolutionary change.

Besides the qualities in human nature which directly subserve one or other of man's two codes of morality, there are others which are of equal service to either code, and which work for the welfare of the evolutionary group. In the forefront I would place that quality of will known as courage; man can be courageous in ill-doing as whole-heartedly as in well-doing. There is the inborn love of self, and yet a readiness to sacrifice self in causes both good and bad. There is that form of mental hunger known as curiosity; urged by this appetite, man discovers with equal zest things which kill and things which cure. There are the virtues of prudence and of temperance, which may be made the playthings of either code. Man may use his gifts of reason and of imagination to further good or bad ends. Loyalty rules among thieves as well as among honest men. If a group is to prosper, there must be within it a desire for children and a love of them. A love of knowledge is also advantageous. All these mental qualities have survival values. A love of beauty may also minister to the survival of a group.

The major obstacle to the acceptance of the group theory of human evolution is the belief, held by most of my contemporaries,

that from the very beginning mankind has been always on the move, jostling against and mixing with one another, and that there has been no long quiescent period when local groups were stationary—such being an essential postulate of my theory. The belief that man has always been a migratory animal is based upon the happenings of a comparatively recent period of human history. Dawning history reveals vast movements of peoples in Europe, in Asia, in Africa, in the New World, and in the islands of the Pacific. It is inferred that these movements of historical times were but a continuation of the movements of the earliest prehistoric period. I regard this view as a mistaken one, for two reasons. My first reason, a minor one, is based on the conditions under which our Pleistocene ancestors had to live. They were dependent on the natural produce of their territories; to gain a bare livelihood was a daily preoccupation. Lack of supplies made long-range migratory movements impossible; incursions into neighbouring territories could have been of the nature of only local forays. It was only after domestication of animals and of plants had made some advance that there were sufficient stocks of food to make long-range and extensive migratory movements possible.

My chief reason for disbelieving in early migratory movements is this. We have to account for the fact that each major racial type of mankind is confined to a single area of the globe; the Negro type to Africa, the Mongol type to Eastern Asia, the Caucasian type to Western Asia and Europe, the Australoid type to Australia and neighbouring islands. If the group theory is accepted, then we can explain such a distribution; a long period in which local groups were comparatively stationary would bring about such a distribution. If there had been, as has been maintained by distinguished authorities,⁷ free migration and mixture in the human world from primordial times, then such distribution of types cannot be explained.

In this preliminary essay I have enumerated the chief points which make up my conception of the mode of man's evolution. To this conception I have ventured, with some degree of temerity, to give the name "Group" Theory. In the essays which make up the remainder of this book, evidence in support of my thesis will be brought forward and discussed.

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² Keith, Sir A., "An Enquiry into the Nature of Skeletal Changes in Acromegaly," *Lancet*, 1911, vol. 1, p. 722. See also my Herter Lectures on "The Evolution of Human Races in the Light of the Hormone Theory," *Johns Hopkins Hosp. Bull.*, 1922, vol. 33, pp. 155, 195.

³ Keith, Sir A., "Certain Factors concerned in the Evolution of Human Races," *Journ. Roy. Anthropol. Inst.*, 1916, vol. 46, p. 10.

⁴ Wheeler, G. C., *The Tribe and Intertribal Relations in Australia*, 1910.

⁵ Giddings, Franklin H., *Principles of Sociology*, 1898.

⁶ Spencer, Herbert, *Principles of Ethics*, 1892, vol. 1, pp. 316, 471.

⁷ See Dixon, Roland B., *The Racial History of Man*, 1923; Haddon, A. C., and Huxley, Julian S., *We Europeans*, 1935.

HOW FAR THE GROUP THEORY DIFFERS FROM OTHER THEORIES OF MAN'S ORIGIN

Synopsis.—The group theory assumes, in common with other theories of man's origin, that the human stem sprang from a simian root. Former authors who have assumed that primitive humanity was divided into numerous small groups or communities. Gimplowitz and Sumner as pioneers. Territorialism and patriotism have not been recognized previously as factors in human evolution. The importance of "group consciousness" recognized by Darwin. Competition and selection are accepted as factors. The combination of co-operation with competition has also been recognized previously. How isolation of groups is secured. Group perpetuation. Inbreeding as a factor. The role of genes in evolution. Multiple small units are assumed to favour rapid evolutionary changes. Fertility has been the subject of most rigorous selection. Primitive groups normally remained fixed to their territories, yet under certain conditions movements took place. Group and individual selection went on hand in hand. Civilization brought about the formation of large groups. The effects of increase of group on evolutionary change. The group theory supplies a background for human evolution. The conception of human nature as a product of evolution is not new, but the contention that it plays an important role in evolution has not been made before.

WHEREIN does the group theory, outlined in the preceding essay, differ from other explanations of man's evolutionary origin? This essay is an answer to that question; in it I propose to discuss the points in which I am in agreement with other students of human evolution as well as those wherein we differ. Such a discussion should help my readers to obtain a clearer idea of the conception I have in mind when I speak of the group theory. In one important point I am in agreement with all my predecessors, with those of the Darwin-Huxley period and their

successors—namely, that the simian root or stock which gave origin to the monkeys of the Old World, and to anthropoid or man-like apes, was also that which gave birth to humanity.

I regard the division of evolving humanity into a multitude of small, separate, competitive communities or societies as the chief feature of my theory. The following passage shows that Darwin was familiar with the idea:¹ "Therefore, looking far enough in the stream of time, and judging from the social habits of man as he now exists, the most probable view is that he aboriginally lived in small communities." Walter Bagehot (1826-77), who was the first to apply Darwinism to the problem of modern politics, describes man's early condition thus: "In the beginning of things . . . each was a parish race, narrow in thought and bounded in range."² Aristotle, speaking of the first appearance of governments, says: "The world was then divided into small communities."³ The same idea was entertained by Archdeacon Paley,⁴ and by Henry Home of Kames.⁵ Writing of a comparatively late phase of human evolution, that of Palæolithic man, the late Prof. Karl Pearson inferred that the social unit "could hardly have been larger than that of a family."⁶ Thus there is nothing new in postulating that early mankind was divided into an exceedingly great number of small communities; what is new is that this mosaic of humanity endured throughout the entire period of man's major evolution and provided the most favourable circumstances for bringing about rapid changes in brain and in body.

Mention must be made here of two men who have preceded me and have realized very clearly that early mankind was separated into a very great number of small competitive communities or social units. One was Prof. Louis Gumplowitz of Graz (1838-1909), who spoke of "innumerable petty units";⁷ the other, Prof. W. G. Sumner of Yale (1844-1910). "The conception of primitive society that we ought to form," wrote the latter, "is that of small groups scattered over a territory. . . . The size of the group is determined by the conditions for the struggle for existence."⁸ Neither of these authors, however, perceived how favourable was the co-existence of a multitude of separate, inbreeding, competitive social units for bringing about rapid, progressive evolutionary changes.

Sumner, in the passage just quoted, adds a feature to which I

attach great importance as a factor in human evolution—namely, that of “territory.” Each local group, or combination of local groups, lived within a demarcated area; a group claimed to own such a territory as its homeland; to this homeland, as to its fellows, a group was bound by that particular form of affection (or prejudice) known as patriotism. The role of patriotism in bringing about evolutionary change will form the subject-matter of a separate essay. My present object is merely to emphasize the place given to it in the group theory of human evolution; so far as I know, the evolutionary significance of territorialism and of patriotism has not been recognized by previous writers on human evolution.

We now turn to examine the mentality of the small groups into which early mankind was divided. We may infer, from what we know of social animals, that the members of each human group were conscious of membership of their own particular community, and were equally aware that their group was different from all other groups. We may designate this mental trait as “group consciousness.” It was not until Darwin came to write *The Descent of Man* (1871) that he perceived that social animals are actively conscious, not of their race or of their species, but only of the community or group to which they belong. “Sympathy,” he noted, “is directed solely towards members of the same community, and therefore towards known, and more or less loved members, but not to all the individuals of the same species.”⁹ In another passage Darwin amplifies his meaning thus: “Primeval man regarded actions as good or bad, solely as they obviously affected the welfare of the tribe, not of the species.”¹⁰

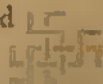
Herbert Spencer, Darwin's great contemporary, went still farther in defining the mentality of the groups into which primitive men were divided. Group consciousness induced a discrimination in the behaviour of primeval mankind; their conduct towards members of their own group was based on one code—the code of *amity*; while that to members of other groups was based on another code—that of *enmity*.¹¹ As a result of group consciousness, which serves to bind the members of a community together and to separate the community from all others, “there arises,” to use the words of Professor Sumner, “a differentiation between ourselves—the ‘we’ group or ‘in’

group—and everybody else—the 'out' group."¹² Thus in a wide field of evolving groups of early mankind there were two mental factors at work: one was "group consciousness"; the other, a dual code of behaviour. Both produce evolutionary results, and are therefore included as elements in the group theory.

Into the group theory come those evolutionary factors which received their first impress from Darwin—competition, selection, survival. Darwin knew that in the mosaic of primitive humanity competition acted chiefly by setting one social group against all neighbouring groups; selection or survival depended on "team-work." Here are Darwin's own words: "And natural selection, arising from the competition of tribe with tribe, in some such large area . . . would, under favourable conditions, have sufficed to raise man to his high position."¹³ The competition which Darwin had in mind was that of team against team; this was also the conception held by Russel Wallace.¹⁴

Two further extracts from Darwin will serve to give my readers a more exact idea of the evolutionary role of competition in a world of primitive humanity broken up into separate units. "When of two adjoining tribes one becomes less numerous and less powerful than the other, the contest is soon settled by war, slaughter, cannibalism, slavery and absorption."¹⁵ Here Darwin emphasizes the cruel side of competitive evolution, but the next extract—and many more might be cited—leads us to realize that he was quite aware, so far as concerns human evolution, that co-operation was combined with competition: "When two tribes of primeval men, living in the same country, came into competition, the tribe including the greater number of courageous, sympathetic and of faithful members would succeed better and conquer the others."¹⁶ Thus competition favoured the tribes which were rich in co-operative qualities. It may be regretted that Darwin did not lay greater emphasis on the part played by co-operation in his scheme of evolution. Kropotkin¹⁷ went to the opposite extreme by exaggerating the part played by "mutual aid" and minimizing competition as a factor in evolution. In the group theory competition and co-operation are regarded as twin factors which work together to bring about evolutionary change. Quite independently Dr. W. C. Allee came to the same conclusion.¹⁸

In the group theory isolation of competing groups is regarded



as a condition which must be present if effective, progressive evolutionary changes are to be brought about. Moritz Wagner¹⁹ held that isolation was a cardinal factor in evolution, an opinion which was never fully accepted by Darwin. The most Darwin would admit was that "although isolation is of great importance in the production of new species, on the whole I am inclined to believe that largeness of area is still more important."²⁰ After Darwin's time G. J. Romanes²¹ sought to restore isolation as a factor in evolution to the place given to it by Wagner. There is thus nothing new in giving isolation a leading place in my theory of human evolution; what is new is the mode by which isolation of competing groups is maintained. The isolating machinery is assumed to be embedded in man's mentality. In every region of the modern world, where tribes still exist as independent entities, we find two opposite dispositions at work—one being *group affection*, which holds together the members of a community, and the other, *group aversion*, which keeps competing, evolving societies apart. These opposite dispositions are not confined to human societies; they are to be seen at work in the communities into which all social animals are divided. We may assume, therefore, that in the very earliest stages of man's evolution, even in his simian stages, "human nature" was already converted into an instrument for securing group isolation.

The group theory assumes that each of the many thousands of groups or communities into which early mankind was divided was the carrier and custodian of a particular assemblage of germinal seeds or genes; no two groups had exactly the same assemblage. If a group is to work out the evolutionary destiny inherent in its genes, it is necessary, not only that it should be isolated, thus preventing intercrossing, but that its integrity and its perpetuation should be maintained for a long succession of generations. Here again we find human nature called in to serve evolutionary ends. There are few desires more deeply ingrained in a man's nature than that which seeks for an endurance of his family, his kin, and his country. Thus, in the group theory, each unit of primitive humanity is regarded as a closed society, one in which mating is confined within the limits of the community; all were inbreeding societies.

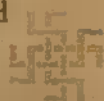
Thus my theory gives inbreeding a high place among the factors which bring about evolutionary changes. If it should

happen that among the genes circulating within the limits of a group there are those of a recessive or evil nature, then, if the inbreeding group be small, these recessive genes will soon be brought together in the course of conjugation. They will thus produce their evil results by bringing about defects in the development of the body, or irregularities in the growth of its parts, or deficiencies in one or more of its functions. Inbreeding, in the presence of defective genes, would thus lead to a speedy extermination of a group. But if it should be that a group's stock of genes were entirely healthy, prone to give rise to variations of a favourable, progressive nature, then inbreeding would tend to enhance their virtues and speed up the rate of evolutionary change. Thus it is assumed that a vast mosaic of competing, isolated units or groups provides the most favourable conditions for bringing about a rapid evolutionary advance.

The later stages of man's evolution seem to have been effected in a surprisingly short period of time. At the beginning of the last geological period—the Pleistocene, with an estimated duration of little more than half a million years—the human brain was relatively small and simple, as shown by discoveries made in Java, China, and England, whereas at the end of the period Cro-Magnon man presents us with the human brain at its zenith.

The theory I am postulating assumes that the character which underwent the most rigorous degree of selection during the small-group period was that of fertility. The tribe with the most and the best parents was the tribe which endured; if the fertility of a tribe failed, its end was soon in sight.

My theory assumes that the competing communities of primitive man were tied to their territories and were in a geographical sense stationary. This is also the opinion of Sir A. M. Carr-Saunders.²³ There is very little evidence of tribal migration or of invasion of neighbouring territories in aboriginal Australia. Conditions during the small-group phase of early man must have been less static than with the Australian aborigines, otherwise successful and progressive types would have been penned up within their territories for ever. The conditions which induce a tribe to spread beyond the limits of its territory are complex. An increase in numbers and in power are conducive to extension, but there must be also a profound change in the emotional mentality of the tribe which bursts its borders. Thus it is assumed



that a disposition to remain fixed and an opposite disposition to move have each of them a place in bringing about evolutionary change.

Although it is assumed that, during the most progressive stages of human evolution, the group or team was the unit on which selective agencies wrought their effects, yet it also recognizes that there was a constant selection of the individuals which made up a group or team. Individual and group selection went on hand in hand.

The group theory assumes that the segregation of mankind into a multitude of small units came to an end with the dawn of civilization. With the coming of agriculture evolutionary units began to grow, culminating in the multi-millioned nations of modern times. What effect has the increase in size of unit had on evolutionary change? To answer this question requires knowledge and faculties beyond those at my disposal, but in a broad way I see that in large populations, crowded in cities, the result has been to render evolutionary changes diffuse, inchoate, and indeterminate, tending to produce a homogeneity of type rather than a number of sharply differentiated local types, as was the case when the evolutionary units were small. Besides, civilization is subjecting modern nations to hundreds of selective agencies of which early man knew nothing. The civilized mind condemns the naked manifestation of all factors which played a part in early evolution.²⁴

My predecessors, in outlining their conceptions of man's evolution by means of diagrams, have omitted all reference to the actual background amid which evolutionary changes took place.²⁵ My theory supplies this background; it assumes that from the earliest to the latest stage of human evolution mankind existed as separated societies, all of them competing to a greater or less degree for their place in the living world. And as the conditions amid which the later stages of human evolution were effected still exist in tribal areas of the earth, we have opportunities of observing how far the assumptions made by the theory postulated here may be regarded as right or wrong. Anthropoid apes still exist as local groups. I am of opinion that a more extended study of anthropoid groups will provide information which will justify us in assuming that particulate grouping was also true of the simian stages of human evolution.

The group theory makes two large assumptions in respect to human nature; first, that it has been built up and matured as man progressed from a simian stage to the full-blown stage met with in modern man; second, that human nature is so constituted as to serve as a chief factor in controlling human evolution. Human nature, as we have seen, keeps the members of a group together; it serves also to keep groups apart; it urges groups to maintain their integrity and continuation; it imbues groups with their competitive spirit. The assumption that man's nature is a product of evolution is not new. We find Bagehot making this statement as early as 1869: "In those ages (of the primitive world) was formed the comparatively gentle, guidable thing which we call human nature."²⁶ Prof. Wm. McDougall also took an evolutionary view of human nature: "There can, I think, be no doubt, that the principal condition of the evolution of man's moral nature was group selection among primitive societies, constantly at war with one another."²⁷ Lastly a confirmatory statement by Wm. James:—

"The theory of evolution is mainly responsible for this. Man, we have now reason to believe, has been evolved from infra-human ancestors, in whom pure reason scarcely existed, if at all, and whose mind, so far as it can have any function, would appear to have been an organ for adapting their movements to the impressions received from the environment, so as to escape the better from destruction. . . . Our sensations are here to attract us, or to deter us, our memories to warn or encourage us, our feelings to impel, and our thoughts to restrain our behaviour, so that on the whole we may prosper and our days be long in the land."²⁸

Thus it will be seen that most of the factors which go to make up the group theory have already been cited by students of human evolution. It is in the way in which these separate factors have been combined so as to co-operate in bringing about evolutionary changes that my theory differs from other theories of human evolution.

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ESSAY III

EVIDENCE OF THE PARTICULATE GROUPING OF HUMANITY DURING THE PRIMAL * PERIOD OF ITS EVOLUTION

Synopsis.—The need for the recognition of two periods in human evolution, primal and post-primal. Evidence of a former tribal organization in Scotland, England, Wales, Ireland, France, Germany, and Spain. Evidence of a tribal grouping among the early Romans. City-States represent tribal entities. Tribalism in Ancient Greece, in the Balkans, in Hungary, and in Russia. Tribalism in Ancient Egypt and Mesopotamia. Tribalism in Asia Minor and in Arabia. The small nations of Biblical Palestine. The mosaic of peoples in the Caucasus, in Persia, in the western Himalayas, in Tibet, and Indo-China. The tribes of Mongolia and Manchuria; the villages of China; the tribes and castes of India. Evidence from Australasia, from the islands of Timor and Celebes, from New Guinea, New Hebrides, and from Australia. The tribal grouping of the Indian population of the New World. Africa as a continent of tribes in all stages of evolution. The evidence of archaeology. Evidence of social grouping among the Primates. From the evidence cited, the author holds that the division of early, evolving humanity into a multitude of small social groups may be assumed as true.

IN this essay I propose to make a hurried circuit of the globe, noting as I pass from country to country the evidence for assuming that their populations are now, or were in former times,

* Students of human evolution are handicapped by the lack of a term to indicate the period of man's evolution before the dawn of civilization and the period which succeeded the dawn. Here I use the term "primal" to cover the very long first period and "post-primal" to indicate the second—the age of civilization. If we assume that 7000 B.C. marks the first glimmerings of civilization, then the post-primal period would have a duration of about 9000 years, whereas we must attribute a duration of a million years or more to the primal period.

divided into separate groups or tribes. I shall begin my survey with the Highlands of Scotland, which is but meet for one who, by birth, is half a Highlander. At the end of the sixteenth century Highlanders were still grouped in clans; there were then forty-two of them, twenty-two in vigorous health, twenty of them broken.¹ Each clan had its chief, its territory, its allegiances, and its enmities. Savage measures applied after the Jacobite rebellion of 1745 brought the clan system of the Highlands to an end. The clans of the eighteenth century may be regarded as the debris of an earlier tribal organization, for in the first century of our era Highlanders had been confederated into sixteen tribes, while the Lowlanders—the population south of the Forth—were arranged in five tribes.

At the corresponding period, the first century of the Roman occupation, the population of England had become confederated into fifteen large units or tribes. Wales, in the Roman period, could claim only three tribes, but there is evidence that these were compounded out of nearly fifty local groups, corresponding to the Scottish clans and Irish septs.³ As for Ireland, the number of her tribes during the earlier centuries of our era is most uncertain, but Keating⁴ was probably near the truth when he put the number of tribes or septs at 110. Prichard,⁵ a very reliable authority, gives the number of Irish tribes as sixteen. The clan system in Ireland was stamped out by warlike measures adopted by Elizabeth, James I, and Cromwell, but the clan spirit remained, and remains, untamed. Gibbon counted thirty independent tribes or nations of the first century in Britain; if he had had the means of estimating the number of British tribal units a thousand years earlier, he would, in all likelihood, have had to multiply his estimate by ten.

We now turn to France as she was in the year 58 B.C., when Julius Cæsar led his army against her tribal communities. The number of her tribal States is estimated variously, and no wonder, seeing that conquest and coercion were always altering estimates. Gibbon gives the number of her independent States as one hundred. Prichard⁶ gives the number as seventy, while Hubert⁷ is content with sixty, but states that these had been compounded out of some five hundred local clans or septs (*Pagi*). Hume⁸ quotes Appian to the effect that there were four hundred nations in Gaul—nations here meaning separate local communities. In

any case, we cannot doubt that the Celtic inhabitants of Gaul were divided into hundreds of separate units, which, in the last century before our era, were being consolidated into larger tribal units. In ancient Germany, as in Gaul, the process of tribal amalgamation was also at work; when the Romans appeared on the Rhine, German tribes numbered about forty.⁹ In Spain of the same period there were at least thirty-five demarcated tribes.

I have failed to find any estimate of the number of separate peoples and tribes which occupied Italy in the year 753 B.C.—the date traditionally assigned to the foundation of Rome. A little later there were then springing up city-States in the Grecian south, and Etrurian confederations of cities were being formed in Etruria.¹⁰ The founders of Rome were three confederated pastoral tribes.¹¹ South of them, in Latium, they were neighboured by some thirty townships, each representing a self-governing community; in the mountainous country to the east there were numerous hill tribes. The founders of Rome, as they grew in numbers and expanded in territory, created new tribes, so that these ultimately numbered thirty-five, but such were artificial, State-devised tribes, quite different in nature from the independent, self-governing tribes and peoples which had grown up in Italy in the course of past evolutionary events. By the beginning of the second century B.C. all the tribes and peoples of Italy had been stripped of their independence, their evolutionary destinies passing under the control of Rome.

Ancient Greece had an area of about 25,000 miles square—being rather smaller than Scotland. When the seven tribes, four Ionian and three Dorian, descended on that land towards the end of the second millennium B.C., they found its inhabitants divided into territorial tribal units; they also found a number of old-established city-States. Coming as conquering, dominant peoples, one may infer that the invaders accepted the tribal divisions which were already in existence, merely imposing on the ancient tribes their persons, their will, and their tongues. The earliest records give four tribes to the State of Attica; these, I infer, represent the tribal units taken over and dominated by the conquerors. Later, in Athens as in Rome, tribes were reconstituted and artificial tribes created. The twelve tribes of Elis may also represent a pre-Grecian division.¹² Paterson has



estimated that there were 150 independent sovereign States in Ancient Greece.¹³

When these States were being established in Ancient Greece, the inhabitants of that part of Europe which lies between the Adriatic and the Black Sea retained their tribal organization. It was so in Thessalia, Macedonia, and Thrace. In Thrace, according to Herodotus, there were fifty tribes grouped into twelve nations. Even in modern times the inhabitants of Montenegro are grouped into more than forty tribes.¹⁴ The Magyars, when they invaded Hungary, were divided into 108 septs or clans.¹⁵ In Russia of the thirteenth century there were sixty-four independent States. Gibbon mentions that in early Russia there were 4,600 village communities, each being an independent entity. In the lands lying to the north of the Black Sea, extending from the Crimea to the mouth of the Danube, there were 129 separate dialects or tongues—evidence of a multitude of peoples grouped in that area.¹⁶

Egypt carries her history into the past more reliably, and more completely, than any other country. Before the union of the Crowns (3200 B.C.) the population of Upper Egypt was grouped in tribal communities along the banks of the Nile. "Each of these tribes was recognized as possessor of its district, which was denoted by the name of some sacred animal."¹⁷ The number of pre-dynastic tribes, or Nomes, has been variously estimated; one authority gives twenty, another forty.¹⁸ During periods of dissolution which overtook Egypt from time to time during the course of her long history one or more of the local communities reasserted their independence. The Berberines, who occupied the banks of the Nile south of Egypt, were also grouped in tribes. Thotmes of the eighteenth dynasty claimed to have conquered 113 of them. Major G. W. Murray states that fifty Bedouin tribes frequent the outskirts of modern Egypt.¹⁹

The city-States which began to be established in the valleys of Tigris and Euphrates towards the end of the fifth millennium B.C. represented separate, independent tribal entities. Round the area of lands occupied by the city-States the native peoples retained their original grouping—that of small tribes. For example, when an early king of Agade carried war across the Persian Gulf, he met with, and conquered, thirty-two petty

kings; Tiglath-pileser (1115-1102) of Assyria prided himself on the conquest of forty-two peoples.

Asia Minor is now, and always has been, a mosaic of peoples. The Hittites and Mitanni arose to power through a series of tribal confederations.²⁰ The modern Kurds are divided into more than three hundred tribes, speaking ten dialects.²¹ The Vilayet of Mosul has been described as "a mosaic of races," each village having its own dialect. South of the area we have glanced at, from Syria in the north-west to Oman in the south-east, lies the vast mosaic of Arab peoples in all stages of tribal evolution. Dr. E. Epstein²² has made a survey of the Arabs inhabiting the southern part of Palestine, known as the Negeb, which is little more than half the size of Yorkshire, and found them divided into five tribes and seventy-five sub-tribes. Palestine itself was occupied by seven independent nations at the time of invasion by the Children of Israel. In his conquest of Palestine, Joshua claims to have encountered and overcome "Kings thirty and one" (Joshua xii, 24).

Proceeding now farther towards the east, we may note as we go the "Babel of tongues and peoples" to be found in the valleys of the Caucasus and the Iliyats of Persia, formerly divided into seventy-three tribes,²³ and so reach the valleys and uplands at the western end of the Himalayas. Here we find the most extensive paradise of robust, independent tribes in all the world.²⁴ Between the Indus and Afghanistan are five millions of people grouped in warlike tribes; in Afghanistan itself, and also in Baluchistan, the former tribal organization is still traceable; on the Pamir, and in the western valleys of the Himalayas, separate peoples and tongues are to be counted by the score. If we make our way to the Far East, crossing Tibet to reach the mountainous lands which lie to the south of China, we meet with a bewildering assortment of peoples and tongues; some have merely the status of a local group; many are separate village communities; others are tribes; while some have reached a status which may be called national. "From the north-western Himalayas to the south-eastern extremity of Farther India," wrote that most able anthropologist A. H. Keane,²⁵ "I have collected nearly a thousand names of clans, septs and fragmentary groups and am well aware that the list neither is, nor ever can be, complete, the groups being in a constant state of fluctuation."



In the days of Jenghis Khan the Mongols were divided into 226 clans out of which forty confederacies had been formed. The Manchus at the time of their conquest of China were divided into sixty tribes. The early history of tribalism in China is unknown, but the strong spirit of localism manifested by her half-million village communities may be taken as evidence that the Chinese still retain a particularist mentality. In contrast to China, India still retains abundant evidence of a tribal distribution of her original population. The castes of India are self-governed, closed societies, tribal in their organization. Indeed, it is often difficult to say whether a particular community is to be called a caste or a tribe. There are 2,378 tribes and castes in India,²⁶ and 225 languages are spoken.

A few instances will serve to show the multi-partite distribution of the peoples of Australasia. In the small island of Timor, Dr. H. O. Forbes found, when he visited it in 1884,²⁷ that forty languages were spoken. In the eastern half of the island, under Portuguese rule, there were forty-seven independent States, each under its Rajah. Evidently the number of States and tongues has undergone a reduction, for in a Report issued in 1944²⁸ Dr. Mendes Correa gives the number of separate tongues as eight, and the number of dialects as fifteen, while he makes no mention of separate States. In the small compass of the northern peninsula of the island of Celebes a conglomeration of separate tribes is kept apart by having twelve different tongues. No census has yet been made of the social units of the great island of New Guinea; they must run into hundreds; some are tribes, others are separate village communities. "In the New Hebrides and in New Caledonia," as J. Macmillan Brown reported in 1916,²⁹ "each village has its own dialect"—evidence that these communities keep apart. We are also ignorant of the number of tribes into which the aborigines of Australia were divided before the white settlement began. If we accept 300,000 as the number of aborigines in virgin Australia, which is the customary estimate, and assign 150 to the average tribe, the original number of tribes would have been about 2,000; probably an underestimate.

A few examples from the New World will suffice to illustrate the tribal constitution of its pre-Columbian population. In the census of the United States for 1910, Prof. R. B. Dixon prepared a detailed Report on the Indian population, which at that time

numbered 305,000. The tribes represented by this population numbered 280; of these, seventy-seven had a membership of five hundred or more; forty-two were reduced to a following of ten or less. What is now the State of California gave a home to 101 tribes; Alaska had sixty-six, besides forty "local groups" of Eskimo. Some of the Indian tribes were very large—the Cherokees, for example, numbering over 30,000—but the average was about 2,000. As with Rome and Greece, so with Ancient Mexico and Peru; in all four cases there is clear evidence of an early tribal constitution. Regarding South America, I shall content myself with citing the list of tribes inhabiting the basin of the Amazon, prepared by Sir Clements Markham in 1910.³⁰ After purging his list of synonyms, the final number he reached, for this area, was 485. In the extreme south, in Tierra del Fuego, the native Yahgans still live in separate local groups, as do the Eskimo in the extreme north. Thus, in the native population of the New World every stage in the evolution of human groups was represented, from local communities to organized States.

Africa is a continent of tribes, but it would take me too far afield to attempt a systematic survey of them.³¹ In 1930 the population of Tanganyika Territory, numbering five millions, was divided into 117 tribes.³² In Northern Rhodesia eighty-one tribes have been enumerated. Dr. W. Hambly³³ gives a list of 117 tribes in the Congo basin and another of sixty-three for tribes in Uganda and Nyasaland. According to Keane there were 108 Sudanese tribes; the Berber tribes of the High Atlas number twenty (Prichard). The Dutch on their first arrival in South Africa came in contact with the Hottentots and Bushmen. "The original Hottentots," Prichard has noted,³⁴ "were a numerous people, divided into many tribes . . . with flocks and herds." The numbers in a tribe varied from several hundreds to a couple of thousand.³⁵ Bushmen, on the other hand, were distributed in local groups, thus retaining what I suppose to be the original organization of mankind. Some of the peoples living in the more remote parts of Uganda appear also to have retained a separate local grouping.³⁶ Even when confederated into kingdoms, as in modern Uganda, or in the kingdoms which arose in the region of Lake Chad in the fifteenth century, the African peoples retain a tribal organization. Thus in modern Africa we

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find every stage in tribal evolution from the local group to a federal tribal kingdom.

We have now completed a hurried circuit of the globe, and the evidence we have met with supports the contention that all living peoples are now, or were originally, divided into small separate units or groups. The conditions of life in the primal period, when mankind depended on the natural produce of the soil for a subsistence, made the existence of large local groups an impossibility. The evidence we have gathered, then, is in conformity with the postulates of the group theory.

There is one source of evidence bearing on the particulate distribution of the early races of mankind which is only now becoming available—namely, that provided by the excavation of ancient sites of habitation. Archæologists are finding that the distribution of stone tools and other remains of human culture in such sites are definitely localized.³⁷ This should be so if early mankind was separated into local groups. So far all the discoveries of fossil remains of early men favour a differentiation into local types.³⁸

The new theory requires proof that mankind was divided into social groups, not only during the earliest stages of human evolution, but in its pre-human or simian stage. Darwin inferred it had been so when he wrote: "Judging from the analogy of the majority of the *Quadrumanæ*, it is probable that the early ape-like progenitors of man were likewise social."³⁹ The leading authority on this matter, Dr. C. R. Carpenter,⁴⁰ has declared that "all types of *Primates* which have been adequately studied in the field have been found to show the phenomenon of territorialism." Territorialism implies division into groups, each group occupying its own area of forest or jungle. Professor Hooton has recently summarized the evidence bearing on the group organization of the higher *Primates*.⁴¹

Such, then, is a summary of the evidence on which I rely when I assume that mankind, during the primal period of its evolution, was divided into an exceedingly great number of isolated social communities.

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ESSAY IV

OWNERSHIP OF TERRITORY AS A FACTOR IN HUMAN EVOLUTION

Synopsis.—Attitude of anthropologists to tribe and territory in 1921. Later it was recognized that territorialism occurs not only among primitive peoples, but pervades the animal world, and was therefore in existence long before man appeared. Evidence from Dr. Heape. Man, the frontier-maker. Trespass and territory. The bonds which bind a group to its territory. Ancestral spirits as a bond. Although tribes are normally soil-bound, an urge to emigrate may arise. In the primal world of mankind we must assume that groups were both static and dynamic. The soil-bond is acquired, but its acquisition depends on an inborn aptitude. There is also a universalist disposition. The part played by territory in the machinery of human evolution. Darwin's observations among the Fuegians. Anthropoid apes have a sense of territory. Archaeological evidence of localism. Nomadic peoples have circumscribed bounds. A sense of territory is much older than a knowledge of kinship.

My inquiries of 1916¹ left me convinced that early mankind had been separated into small social units or groups; another surmise also proved true—namely, that each group, so far as information was available or could be obtained, lived on a delimited area of territory of which it counted itself the eternal owner. Why did I make this surmise? It was because I had conceived that if a group were to work out its evolutionary destiny, to develop its germinal potentialities, it must not only be kept from other groups, but must remain anchored to its homeland for a continuity of generations. Ownership of territory would provide both these conditions.

How far my fellows were from sharing in my beliefs may be illustrated by an extract from an address given in 1921 by one of the leading anthropologists of my time—Sir Baldwin Spencer: ²

"The extraordinary number of tribes (of Australia), each with its own dialect and occupying its own country, is one of the most difficult things to explain in Australian ethnology." The conditions which my colleague found so difficult to explain were just those which I had been in search of in 1916; they are essential parts of the machinery of group evolution.

At the time this is written (February, 1945) naturalists throughout the world recognize that group ownership of homeland—territorialism—is not a human prerogative, but pervades the whole of the animal kingdom. Early interest in this subject was certainly stimulated by Howard's observations on bird territories.³ Our present knowledge of this subject, as far as animals in general are concerned, has been summarized by Dr. Julian Huxley,⁴ and by Professor Allee,⁵ so there is no need for me to touch on it, save to give one instance which illustrates the close similarity there is in the arrangement of bird and human territories: "Chaffinches in the southern U.S.S.R. can be distinguished solely on the basis of variation in song; they are divided into well-defined populations, each confined to a given area."⁶ I am tempted to correlate variations of song in bird groups with variations of dialect in human groups.

My friend Dr. Walter Heape (1855-1929), who made many important additions to our knowledge of the sexual processes in animals, became interested in his later years in their migrations, hoping to trace a connection between the migratory impulse and the state of the sexual system. His inquiries led him to study the opposite of the migratory impulse—the tendency of animals to cling to their homelands. After his death in 1929 at the age of seventy-four, the data he had collected were edited and published by Dr. Marshall.⁷ Two extracts from this work will put readers in touch with Dr. Heape's main conclusions: "What I aim at emphasizing is the fact that within the area over which a species is distributed, separate bodies or, as I shall call them, colonies of that species, occupy definite parts of that area, and rarely, if ever, leave that territory" (p. 30). The above extract relates to animals in general; the next bears on the law of territory as it affects man: "In fact, it may be held that the recognition of territorial rights, one of the most significant attributes of civilization, was not evolved by man, but has ever been an inherent factor in the life history of all animals" (p. 74).

I may usefully supplement these quotations, with which I am in complete agreement, with observations made by various authors bearing on the delimitation of tribal territories. Canon Pythian-Adams, describing the Arab tribes of the region of Mount Sinai, reports: "Even to-day the limits of tribal territory are laid down with remarkable clearness."⁸ Spencer and Gillen, in their account of *The Northern Tribes of Central Australia* (1904), record "that from time immemorial the boundaries of the tribes have been where they are now fixed." After noting the diversity of the dialects spoken by the native tribes of Tasmania, Mr. Norman Walker adds: "Groups kept to their own territory; trespass meant war."⁹ The following quotation from Malinowski refers to the village communities of the Trobriands: "The roaming grounds of every group are subject to exclusive, although collective, rights of this group."¹⁰ The identification of a tribe with its territory is shown by the Arab custom of using the same name for territory as for tribe; the ancient Greeks had a similar custom.¹¹

Man is the only animal that surrounds his territory by a delimited frontier; a frontier is, to him, a matter of life and death; he regards it with a sentiment which is almost religious in its intensity. "To infringe boundaries of a neighbouring tribe," writes Keane, "is to break the most sacred law of the jungle and inevitably leads to war."¹² Every tribal boy has to learn from his elders the limits within which he may roam and hunt, but there is something inborn in a boy's nature which makes him eager for such learning. At what point of his evolution man turned a frontier-maker we can only guess; certainly his faculties of conscious observation and of reasoning must have made a considerable advancement towards their present degree of proficiency. Anthropoid apes, although they confine their wanderings within a locality, have no sense of frontiers. The street dogs of Constantinople are said to have had a sense of territory and to have resented trespass; wolf-packs are also credited with a similar partiality.¹³ Baboons resent intrusions on the places where they sleep and breed,¹⁴ but this is rather a manifestation of a sense of "home" than of territory. The robin resents the rival who trespasses on his "home" territory.¹⁵

The penalty inflicted on an uninvited or unaccredited stranger who crossed a tribal frontier of aboriginal Australia was death;

all authorities are agreed on that. It was also the law in primitive tribal communities in other parts of the earth. One can understand why a tribe should resent and repel invasion of its territory by another tribe; if it did not, then independent tribal life came to an end. That a tribe should seek to protect its game and the natural produce of its land is also understandable; if it did not, it would starve. But why this resentment against a single intruder? Here, I think, we are dealing, not with a trespass of territory, but with a trespass on the tribe or community. We shall see, when we come to deal with the manifestations of "group consciousness," that animal communities of all kinds resent the advent of "gate-crashing" strangers. It is to this ancient category of instinctive animal reaction that I would assign the practice of the Australian aborigine towards strangers. A group that was destitute of this reaction would be liable to germinal contamination.

What are the bonds which bind a primitive group to its territory? Every group, being surrounded by other groups, each jealous of its territory, may be said to be hemmed in, and thus confined to its territory. This is a negative bond, but there are also those of a positive nature. There are mental bonds; a deep affection binds a group to its soil. Radcliffe-Brown, who visited and studied the tribes of Western Australia,¹⁶ has this to say about the attachment of a native to his locality: "Just as the country belonged to him, he belonged to it . . . wanted to die in it." So with the Bushman of South Africa; "he is strongly attached to his territory."¹⁷ Malinowski described these bonds in purely objective terms. "The Australian tribe," he wrote, "is bound to its territory by tradition, totemic cult, and initiation ceremonies."¹⁸ Now, these terms are true as far as they go, but they leave out the main element of the bond—the ready, passionate response made by the Australian lad to his elders when they expound to him the sacredness of their soil. Love of one's native soil is the basal part of patriotism, and will be dealt with when that subject is considered. Affection for locality of birth is instinctive in all social animals.

Tribes are bound to their territory by a peculiarly human bond. Spencer and Gillen¹⁹ note that Australian tribes never invade the territory of a neighbour, and explain their behaviour thus: "No such idea ever enters the head of the Central

Australian, because he believes that every territory is the home of the spirit ancestry of its original owners and is therefore useless to any one else." The belief that gods and ancestral spirits are endemic in their soil is held by tribal peoples in many parts of the world—in Melanesia, in North Burma, in India, and in West Africa—such peoples being thereby bound to their territories. There is a well-known Biblical record of this belief: "The nations which thou [the king of Assyria] has planted in the cities of Samaria know not the manner of the God of the land."²⁰ The Marquis of Halifax (1633–95) touched the same theme when he declared there was a "divinity in the soil of England."

So far I have been giving my reasons for believing that in the primal world human groups were rooted to the soil. If that had been the case—as it appears to have been in aboriginal Australia—then an enterprising group, multiplying in numbers and in power, would have had no advantage over its static neighbour. It was otherwise among the tribes of Gaul and ancient Germany; tribes were normally bound to the soil, but from time to time a different and dynamic mood arose in them, which compelled them to pull up their roots and, by conquest, win a new abode. For progressive evolutionary change both moods are needed: the steadfast mood which anchors a group to its territory, and the impetuous mood which urges change. I assume that both of these moods had their place in the primal world of mankind. The exodus of a people had a likeness to the mass migration of animals, a subject in which Dr. Heape was greatly interested and of which he wrote:²¹ "There is surely some nervous excitement attending the proceeding, both during the preparation for exodus and during the progress of the journey. In some cases it would seem that a condition of hysteria is reached."

In support of the soil-bond I might cite Walter Scott's patriotic lines:—

Breathes there the man, with soul so dead,
Who never to himself hath said,
This is my own, my native land!

But were I to bring Scott forward as a witness, I know that there are hundreds who would answer that, not only was their "soul dead," but, so far as concerned their native land, it had never been alive.²² Patriotism, they declare, is an acquired passion. I agree with them. If I had been born in Ireland, I

would have been a patriotic Irishman; if in France, a patriotic Frenchman. But I could have been neither unless I had been born with that in me which answers the call of the soil.

Yet I know that such is not the whole truth of this matter. Many of those who decry patriotism are moved by the high ideal that seeks the union of all peoples in a universal whole. There is, I admit, imbedded in human nature, a vague longing to lift the spirit of fellowship above the narrower limits of tribe, nation, and race, and this feeling seeks to replace the patriotic spirit. Human nature, as we shall try to prove in a future essay, is dual, and in patriotism versus universalism we have a contradiction which man's dual mentality makes possible. I ought to add that the spirit of patriotism—love of the soil—may die of starvation in the hearts of those born in great cities.

I have been placing before my readers the grounds for believing that the primal world, inhabited by evolving mankind, was a checkerboard of territories on which the great game of evolution was played. We have now to inquire more minutely into the part played by territory in that game. Let us begin with a modern instance. In 1933 gold was discovered in the native territory of Kenya, and natives were evicted in order that the gold might be mined. A writer in *Nature*²³ rightly protested against the eviction, and on the following grounds: (a) The land owned by a tribe is necessary for its subsistence; (b) it is equally necessary for the solidarity of the tribe; (c) dissolved from its territory a tribe's organization, its automatic form of government, falls to pieces; and (d) the territory is the home of the living spirits of the ancestors of the evicted natives. Here, then, in a modern instance, we have brought home to us the part played by territory in securing the independent and continued existence of a tribal group; without territory a separate community could not work out its evolutionary destiny. Here, too, we have an illustration of the way in which civilization clears native inmates from their checkerboard territories to make room for larger units.

It has always seemed to me a curious thing that Darwin, who was the first to observe the limitation of groups of primitive humanity to definite tracts of land, should never have attributed an evolutionary significance to his observations. His studies were made in December, 1832, when the *Beagle* landed in their native habitats three young Fuegians who had wintered in



England to learn the ways of civilized man.²⁴ "The different tribes," wrote Darwin, then in his twenty-fourth year, "have no government or chief, yet each is surrounded by other hostile tribes, speaking different dialects, and separated from each other only by a deserted border or neutral territory. . . . I do not know anything which shows more clearly the hostile state of the different tribes than these wide borders or neutral tracts." These observations relate, not to organized tribes, but to local groups of humanity, living under the most primitive conditions, and reflects what I assume to have been the universal state in man's primal world.

In the preceding essay I gave a quotation (p. 26) from Dr. Carpenter²⁵ to the effect that territorialism existed in all kinds of Primates which had been examined for this condition. We may presume, I think, that all the genera which emerged from the primate stem were subjected to group evolution, and that territorialism was in existence long before the differentiation of mankind. "The chimpanzees," records Dr. Heape (p. 67), "are, in fact, home-loving like all apes, and do not forsake the place in which they were born unless under special stress of circumstances." Dr. Carpenter also noted the fact "that gibbons are intolerant of trespass by other gibbons"—evidence that this anthropoid has a sense of territory. Professor Hooton of Harvard is one of the few writers who have discussed the possibility of a relationship between territorial grouping and evolution. After a review of the group distribution of Primates, he adds the following passage:—

"It would appear that this primate tendency to maintain territoriality must be closely bound up with the differentiation of races, and varieties, and even species, by selection and inbreeding. . . . Further, it would seem necessary to postulate some such innate or acquired habit . . . to account for the early differentiation of the physical varieties of races of mankind."²⁶

I quote this passage as evidence of the large measure of agreement there is between Professor Hooton and myself as to the part played by territory in the process of evolution.

When dealing with the division of primitive mankind into small groups, in the preceding essay, I alluded to the light that archæo-

ologists are throwing on this problem (p. 26). Here I would add other instances where excavation of ancient sites provides evidence of localism and, presumably, of territory. For example, Mr. T. T. Paterson when examining stone industries (Clactonian, Ivallois) which have an antiquity of perhaps 100,000 years found evidence of "local industrialism."²⁷ Leslie Armstrong, in his investigation of tools of caveman of the Upper Palaeolithic period, observed that "industries display local differences."²⁸ Hubert records that in Loraine tribal fortification of the early Iron Age can still be detected;²⁹ and several other instances might be cited.

At the beginning of this essay I noted the fact that my contemporaries were reluctant to accept the idea that primitive societies were small and stationary.³⁰ They were impressed by the migratory tendencies which have pervaded so many peoples during historical times, and they assume that this had also been the case with early men. I have indicated my reply to this objection in an earlier essay (p. 8). They were also impressed by the belief that nomadic peoples knew no bounds. As regards this matter Dr. Heape came to the same conclusion in 1929 as I did in 1916. "The great majority of nomadic peoples and nomadic animals," he affirmed, "roam only over a definite territory" (p. 16).

Perhaps the chief obstacle to the acceptance of my doctrine was the belief that then prevailed among anthropologists—namely, that the original groups of mankind were formed on the basis of kin—of blood relationship—and that it was at a later date that territory became a bond. The advocates of the priority of kin had the powerful support of Sir Henry Maine, Durkheim, Andrew Lang, Marett, and of many others.³¹ On the other hand, men like Haddon and Rivers, who based their opinions on observations made in the field and among primitive peoples, were convinced that, from the first, human groups were based on territory. From the evidence now available we cannot any longer doubt that the bond of territory is infinitely older than that of kin. The anthropoid mother knows her young child; there is some evidence that she even recognizes her children until they reach a certain age, but man is the only animal that can trace blood relationships and is therefore capable of constructing genealogies. Man must have reached a considerable degree of mental capacity before he became genealogist. I would hazard the guess that

man marked out frontiers before he constructed genealogies. And yet the fact remains that there are peoples in the world of to-day who are devoid of territory and yet maintain their solidarity. Such peoples will come up for consideration when the evolution of races is discussed (Essay XXXVII).

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ESSAY V

GROUP SPIRIT AS A FACTOR IN HUMAN EVOLUTION

Synopsis.—Group spirit defined. Sympathy, which is the basis of the group spirit, is confined to communities of a species, and does not extend to the species as a whole. This is true of human and of animal groups, and is presumably true of the primal groups of humanity. Consciousness of kind: its various applications. "Like will to like" examined. Man's social appetite as a driving force. Primal groups were "closed" societies. Aversion to strangers: a genetical explanation. How far the group spirit is inborn, and how far acquired. The dual spirit generates a dual code of morality. Group formation leads to group selection. Evolution in the primal world of humanity was mainly a group or team selection. There was no colour bar in the ancient world. The group spirit was evolved from the family spirit.

I AM seeking to build up a picture of the life led by mankind during the primal age, the age which saw man attain his manhood. In the two preceding essays evidence has been given for believing that mankind was then divided into small groups, and that each group occupied its own tract of land. In this essay we are to inquire into the means which keep members of a group together and, at the same time, keep them apart from surrounding territorial groups. These means, we shall find, are embedded in man's mental nature. There is a disposition or spirit in every man which leads him to extend his sympathy, his goodwill, and fellowship to the members of his group; he is also conscious of his membership and feels that his own life is part of that of his group. To this bundle of mental traits, which gives unity to a group and separation from other groups, I am applying the term "group spirit," which has thus much the same connotation as "*esprit de corps*." Group spirit induces a certain form or pattern of behaviour; this form of behaviour I shall speak of as "clannishness."

Having thus defined the terms I am to use, I now turn to the evidence which permits us to assume that a group spirit prevailed in the small communities of primal man. As usual, Darwin supplies the most telling evidence. "Sympathy," he notes, "is directed solely towards members of the same community, and therefore towards known, and more or less loved members, but not to all individuals of the same species."¹ Primitive groups being small, their members were known to one another by personal contact. Darwin was of the opinion that "the confinement of sympathy to the same tribe" was one of the chief causes of the low morality of savages.² In this instance Darwin viewed tribal life from the point of view of a civilized observer. Two further quotations from Darwin will throw additional light on group mentality. "Primeval man regarded actions as good or bad, solely as they obviously affected the welfare of the tribe—not that of the species, nor that of an individual member of the tribe."³ Writing of living tribal peoples he notes that "the virtues are practised almost exclusively in relation to the men of the same tribe," while the corresponding vices "are not regarded as crimes" if practised on other tribes.⁴ Darwin's observations have been confirmed over and over again by travellers who have studied primitive groups of mankind at first hand. On such evidence we have grounds for assuming that the small communities of early man were also swayed by a group spirit.

When that evidence is supported by the knowledge that all social animals whatsoever, be they ants or be they apes, are subjects of the group spirit, we may assume with a high degree of assurance that man's simian ancestors and the earliest forms of man were also its subjects. In the following passage Darwin refers to social animals:—

"For the social instincts lead an animal to take pleasure in the society of its fellows, to feel a certain amount of sympathy with them and to perform certain services for them . . . but these feelings and services are by no means extended to all the individuals of the same species, only to those of the same association."⁵

Darwin was by no means the first to note that mutual sympathy did not extend to all members of a species, but was limited to groups of a species. A wise and observant Scottish judge, Henry

Home of Kames (1696-1782), noted that in animals "affections are limited to a community" and not to the species. "Every species," he continues, "is divided into small tribes . . . which do not associate," and then he proceeds to cite examples he had observed. He also makes the pertinent remark that the size of a group is determined by two circumstances: it must be big enough for its defence and not too big for its provender.⁶ Later, he continues: "The social appetite in man comprehends not the whole species but a part only, as among animals. One of moderate extent invigorates every manly virtue . . . nature has wisely limited the social appetite."⁷

Thus we find that every species of social animal is divided into independent groups; that each group is dominated by a separatist, self-regarding group spirit; that competition, selection, and survival involve a struggle, not between species, but between groups of the same species. Such, we must assume, was the state of evolutionary conditions on the checkerboard of primal humanity.

The group theory, then, assumes that in all social animals—and man is eminently such—there is an instinctive or inborn urge to the formation of social groups. Group spirit is the mental machinery involved in group formation. As a label for this machinery Prof. Franklin Giddings,⁸ towards the end of the nineteenth century, gave the name "consciousness of kind," intending to give a more precise meaning to the term "sympathy" as used by Adam Smith.⁹ Giddings's use of this term will best be made clear by quoting one of his illustrations: "The southern gentleman who believed in the cause of the Union, none the less threw his fortune with the Confederacy, if he felt himself to be one of the southern people and a stranger to the people of the North." The southern gentleman was pitting reason against his inborn sympathy, and his "consciousness of kind," or group spirit, won. Professor Giddings cites the social groups or communities which were formed as civilization spread westwards across the United States, groups containing representatives of many European nations. In such cases association made unlike kinds into compact social groups. A group was formed, not because its members were conscious of kind, but because all were inheritors of the group spirit of early man.

It is important to note that Professor Giddings applies his term

to a much wider field than is included under the term group spirit. He applies it to the recognition which members of the same species display towards one another, as dog to dog, or cat to cat, or man to man. Now, such recognition is quite different from that which leads a member of a group to recognize fellow members. Social sympathy, even among animals, is confined to fellow members, and one may assume it was also so among the groups of primitive, evolving humanity.

Our main concern in this essay is with the mentality which controlled group organization in man's primal world. There are, however, in modern mankind certain mental exhibitions of a group-forming tendency which will repay consideration here. "Like will to like" is a truism which has come down to us from the ancient Greeks. We see this aphorism illustrated in the cities of the East, where each nation or sect occupies its own quarter. We see it again in the cities of the New World, where immigrants from the Old World seek out groups of their fellow nationals. Like has sought out like, and in such instances we may attribute such preferences to "consciousness of kind" or to group spirit. But in the following instances of like seeking out like we move into another class of phenomena. Darwin records instances of animals of a particular breed, or those possessing certain markings, preferring mates of the same breed or markings.¹⁰ Julian Huxley gives an instance of a similar preference in a human community.¹¹ Among the Indians of the Panama there is a community of albino or "white" natives; the surrounding coloured Indians have "a feeling against marrying white"; so the whites are left to mate together. "Here in man himself," adds Dr. Huxley, "is a case showing with almost diagrammatic clarity how evolutionary change may originate." Darwin's examples, and Huxley's, are cases of sexual selection apparently based on a recognition or consciousness of kind, but the purpose served has nothing to do with the formation and maintenance of social groups.

There is one circumstance underlying the group spirit which is in need of emphasis. This spirit assumes the existence of man's social appetite and the need of satisfying that appetite by seeking its gratification in the company of his fellows; without that appetite there could be no group formation. This is true of all social animals, and we may therefore assume it to hold for the

most primitive of men. It is only when human beings are deprived of all contact with their fellows that they learn what the compelling force of social starvation really is. We may safely assume that our most remote ancestors were thus constituted, and that the member who strayed from his group was urged back to it by social hunger; and so groups were kept intact.

There is another assumption which may be made with a high degree of safety as regards the primal groups of mankind—namely, that each group formed a "closed society," the only entrance into it being by birth, although entrance by adoption cannot be altogether excluded. Farmers know very well that their field herds resent the introduction of strangers and seek to exclude them from their midst, even strangers of exactly the same breed. If, however, the original herd is turned on fresh pastures, previously unknown to it, and before the strangers are added, the strangers will be more readily accepted, which suggests that a sense of territory may also be concerned.¹² Dr. Carpenter, who has made a special study of monkey groups, observed that intruding strangers were forcibly expelled, although he did see one persistent young male ultimately accepted by a group.¹³ The native colony of Gibraltar apes, having become depleted in numbers, was reinforced by animals of the same species introduced from Africa. All the introduced apes, save a strong male, were killed by the original colonists.¹⁴ A female gibbon that had been some time in captivity was released by her owner in her native forest in Java near a group of her own species; she was driven off by the group. Seeing how prevalent an antipathy to strangers is among primate groups, it is highly probable that it was also a trait of the earliest human groups.

"No propensity," asserts Lord Kames, "is more general in human nature than aversion to strangers."¹⁵ He then asks a question: "What good end can this perversion promote?" The question can be put in another form: Why are the groups formed by social animals in a state of nature maintained as closed societies? An explanation can be given on genetic grounds. If we regard a group as having been separated from other groups in order to inbreed, and so to work out the evolutionary potentialities of its genes, then we can see why it should resent instinctively the intrusion of outsiders bringing with them strange genes. The rejection of strangers might also be explained on

social grounds: if they came in numbers they would disrupt the automatic government of the group. Epinas was in the right when he averred that "hatred of strangers is an index of tribal consciousness."¹⁶ He might well have added that the friendly reception of strangers could be used as an indication of the degree to which the "old Adam" of the group spirit has been eradicated from man's nature by civilization.

We come now to a question of the highest importance. ■ the group spirit which we are attributing to primitive communities of mankind, and which pervades the modern world under the name of "race consciousness," an instinct born in a child's nature, or is it acquired as the child grows up? Darwin's answer is equivocal. He emphasized the limitation of sympathy to the members of a group, and added, "Sympathy, although gained as an instinct, is also strengthened by exercise and habit."¹⁷ Now, every social group, whether simian or human, is a school in which the young absorb the traditions, the customs, the habits, the prejudices, and modes of behaviour of the group. A child sees the group spirit at work as it grows up, and accepts a clannish behaviour as part of its heritage. Mr. J. H. Taylor,¹⁸ Dr. Raymond Firth,¹⁹ Julian Huxley,²⁰ and many more, regard the manifestations of the group spirit or race consciousness as the result of what the young learn in the school of the tribe. Bring a white boy up in a Bantu tribe, and the boy will have the group spirit of a Bantu tribesman. Those authors, in my opinion, have considered only one side of the problem—namely, the direction or complexion taken by the group spirit. They have concentrated their attention on the product and forgotten the producer, which is an inborn disposition. Can it be said that sympathy, which is a disposition to suffer with, and to aid others, and which is the basis of the group spirit, is an acquired quality of human nature? The disposition to sympathize is certainly inborn, but, as Darwin contended, it can be strengthened by example and practice.

It may be asked in reply: why is sympathy and the group spirit limited to a community? Is that not a result of tuition or example? Let us see what we can learn of this matter by noting the action of this spirit in herds of cattle. When Darwin was on the *Beagle*, he visited a large ranch in Uruguay, so that he might acquaint himself with the management of large herds of cattle. When feeding, the animals formed groups, each group

having a membership varying from forty to a hundred; the membership of each group was constant; the cattle discriminated between their own and other groups. "During a stormy night," adds Darwin, "the cattle all mingle together, but next morning the tropillas (or groups) separate as before; so that each animal must know its fellows out of ten thousand others."²¹ Here, then, we see the group spirit at work among social animals, controlled by an innate disposition or instinct and not by a taught or acquired tradition. May we not assume, then, that the group disposition or spirit was also inborn in the most primitive forms of humanity? In them, we must presume, it was moulded and biased by the tradition and the teaching of the groups.

It will thus be seen that the group spirit implies a discrimination between groups. A tribesman's sympathies lie within the compass of his own tribe; beyond his tribe, begin his antipathies; he discriminates in favour of his own tribe and against all others. This means also that the tribesman has two rules of behaviour, one towards those of his group and another to the members of other groups. He has a dual code of morality: a code of "amity" for his fellows; a code of indifference, verging into "enmity," towards members of other groups or tribes. Seeing, then, that all social animals are subject to the group spirit, and that it brings about a dual code of morality, may we not assume that on the chequerboard of the primal world the same spirit animated evolving groups of mankind?

The question now arises: Why was primitive humanity divided into small, separate, contending groups? My answer is that which both Darwin and Wallace gave—namely, that men who were arranged in groups or teams, each dominated by a spirit of unity, would conquer and outlive men who were not thus grouped. In brief, human evolution was, and is, a process of team production and team selection. No doubt, in our primal world there was individual selection within each team or group, but it was the team worker rather than the strong individualist who was favoured. In this way the group spirit played a leading role as a factor in human evolution.

In this essay I have kept flitting between the ancient and modern world of humanity, carrying facts and assumptions from the one to throw light on the other. Continuing my argument along these lines, I would now call attention to the fact that, in the

modern world, at the time history begins, each large area was inhabited by its own physical variety of mankind. If we take the area of Mongolian distribution, for example, and beginning on the Arctic shores with our steps turned in a southward direction, we shall meet as we proceed no sharp break in the physical type until we reach the shores of Australia. The type with which we begin is very different from that with which we end, yet the change is so gradual that nowhere can we distinguish one local community from another by physical criteria. Now, I assume that the distribution of mankind in the ancient world was similar. Adjacent local groups were of the same physical type; their differences were cultural; each group had its dialect, its customs, its traditions; each had its own spirit. Nowhere was there a colour bar; only in recent times have communities of black and white been brought into juxtaposition. When such communities are brought to live side by side, the community spirit is apt to assume a new fierceness and receives another name, "race consciousness." To this aspect of the group spirit I shall return when I come to deal with the evolution of races (see Essay XXXV). The turbulent group or tribal spirit is here aggravated by the fact that the contestants have been fitted out by Nature in different physical uniforms.

One other point concerning man's group spirit deserves consideration before this essay is brought to a close. Can any rational explanation be given of how it became a constituent element in human nature? I regard it as an extension of the family spirit, the spirit or disposition which leads the members of a human family, both parents and children, to discriminate between their own and other families. The members of a normal family are prejudiced in favour of one another. Their attitude towards their own family is different from that which they hold to other families. They resent the intrusion of strangers to a place in the family circle. When children graduate from parental control to take their place in the life of their group, the family feeling or spirit expands so as to embrace all the members of a group, as if the group had become their family. As Darwin and many others have maintained, the mental bonds which hold a family together gave rise to those which unite members of a social group or tribe.

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PATRIOTISM AS A FACTOR IN HUMAN EVOLUTION

Synopsis.—Group spirit and patriotism compared. Patriotism considered under three heads: (a) its relationship to group territory; (b) its relationship to the life of the group, to the fighting spirit, and to loyalty; (c) its relationship to group status. Qualities which have been ascribed to patriotism. Patriotism as a factor in evolution. Patriotism is made up of two elements: the one is mental and is inbred; the other is educative and is acquired. Patriotic feelings may remain latent. Patriotism is an expansion of the individual instinct of self-preservation. The relation of fear to patriotism. Patriotism has a kinship with religion. Group spirit and patriotism are based on partiality—a congenital warping of the judgment. Patriots obey a dual code of morality. It may be said that evolutionary procedure is based on injustice. Chauvinism.

IN the preceding essay we examined the mental machinery which breaks social animals into groups or communities, and which serves to maintain each group as a separate unit. Seeing that this mental machinery, the group spirit, is of ancient origin, we have presumed that the groups of early humanity were also under its sway. In this essay we are concerned with another set of mental activities—namely, those which serve to safeguard and protect the group which, when danger threatens from without, or from within, muster forces for the defence of the group. This set of mental activities, which automatically arms the members of a group in its defence, is known as patriotism. Since such defensive mental reactions are to be observed in social animals of all kinds, we may safely presume that patriotism had a place among the primal communities of mankind.

Patriotism is an exaggerated and prejudiced form of affection which is manifested by members of a group or tribe in at least three directions. First, it leads to the development of special

bonds of affection between a group and its home territory, and so anchors it to its homeland. The homeland may be bare and barren, but, in the eyes of the native, patriotism turns it into the best and most desirable of all lands. The alchemy of love, working in the fevered brain of Don Quixote, turned a plain country wench into a princess. So the alchemy of patriotism, working in the brain of a tribesman, converts a moorland into a paradise. The more a man loves a thing the more ready is he to defend it, to fight for it, and, if need be, to sacrifice his life to save it. Thus is the territory of a group safeguarded and the integrity of the group preserved. Patriotism provides the group with a mental armour for the defence of its homeland. Seeing that all social animals manifest a predilection for their native habitat, we may presume that the primal groups of humanity had a special attachment to their homelands and were in this sense patriotic. The blackbird which risks her life to save her nest and brood from the maw of a prowling cat gives an exhibition of blind patriotism.

A tribesman's patriotic bias is not confined to the care of his homeland; it extends to his group or tribe and to everything connected with the tribe—to its welfare, to its prosperity, to its safety, and to its good name and fame. The tribal totem, or god, he regards as more powerful than other totems or gods; his tribal speech, customs, manners, and ways of life are superior to all others. In times of peace the patriotic feeling or spirit is more or less at rest. But when the life of the tribe is threatened, these feelings rise to fever heat; they become a violent passion which takes control of the tribesman's will and forces it blindly on to action. Next door, as it were, to the feelings which support the patriotic impulse are those which sustain man's fighting spirit, which supplies the physical force needed in defence of the group. Thus man's patriotism lies at the root of war. As every group or community of social animals is provided with a mental machinery for its defence, we may safely assume that the very earliest groups of humanity were not destitute of it. The male gorilla manifests patriotic feelings when his group is in danger, for he then turns on, and attacks, the assailant, and kills or is killed, so that his group may live.

There is an aspect of patriotism which deserves special consideration. We have already noted that it involves a strong and

constant partiality in a man for everything connected with his group. This is especially true of his attitude to the elders or leaders of his group, or, if leadership has passed into the care of chief or king, then to chief or king. The leaders being at the centre of group defence, we should expect patriotic devotion to go out to them in special measure. So it does, only it takes a peculiar form—the form known as fidelity or loyalty. Loyalty is a blind, prejudiced, unswerving, unreasoned attachment to those in command. Yet I do not regard loyalty as a constituent part of patriotism. In this I am in opposition to a very clear thinker, Prof. W. G. Sumner, who defined patriotism as "loyalty to one's group."¹ Loyalty is akin to patriotism and, like the fighting spirit, is a close adjunct to it. Loyalty finds its natural place in the leadership and organization of a group, and will come up for further consideration when these subjects are discussed in a later essay. (See Essay XII.)

There is a third aspect of patriotism to which I attach a high importance. It imbues the members of a group with a sense of pride in their membership; it fosters the conviction in their minds that their group is the paragon of groups. This was the aspect of patriotism which caught Darwin's attention in the person of Jimmy Button, a Fuegian lad who was carried back to his native land on board the *Beagle*. "He was of a patriotic disposition," Darwin notes, "and he liked to praise his own tribe and country, in which he truly said there were plenty of trees, and he abused all the other tribes; he stoutly declared there was no devil in his land."² An Australian aborigine has the conviction that his tribe is the hub of the universe. Westermarck³ found this type of tribal exaltation among all native peoples, so we may venture to ascribe it to the groups of humanity which peopled the world in primal times.

It will have been noted that Jimmy Button's patriotic feelings gave vent, not only to praise of his own tribe, but led him on to decry all neighbouring tribes. Patriotism leads on to emulation, to jealousy, to competition between neighbouring tribes, and is thus a source of contempt and of strife. No tribesman, or band of tribesmen, will remain unmoved if they hear any aspersion cast on their tribe. The good faith of a tribe, its honour, its status or place among other tribes, and the superiority of its god or totem are sacrosanct; such convictions must not be questioned by any-

one outside the tribe or even within it. Thus patriotism incites an unending contest for tribal status. "Patriotism," said the late J. M. Robertson, "is pride of power . . . a banal pride."⁴ Certainly pride of power moves the heart of the modern patriot, and one may suspect that power or prowess was equally potent in ancient days. Patriotism gives to a tribe a feeling of invincibility, a valuable asset for any human community involved in the struggle for survival.

McDougall describes patriotism as "a master sentiment,"⁵ and seeing that in the throes of war it can and does overcome the strongest of man's instincts, that of self-preservation, this description must be regarded as valid. Hankins regards it as "the most powerful of social forces."⁶ "The supreme value of patriotism," wrote Martin Conway, "is not in provoking hostility, or resisting the rivalry of other countries, but in its unifying, nation-making force."⁷ George Orwell says of patriotism that "as a positive force there is nothing to set beside it."⁸ Gibbon regarded patriotism as "a public virtue," and as "a source of strength in war."⁹ I look on patriotism as an heirloom which has come down to modern man from a very remote past.

We have now to seek for an answer to the important question: In what way does patriotism serve as a factor in producing new types of mankind? Let us proceed on the assumption that primitive humanity was separated into exclusive, self-contained groups; such separation permitted each group to work out its own germinal potentialities. To do that, each group must be master of its own independence; only as an independent unit can a group work out its evolutionary destiny, and it must maintain that independence over countless generations. Patriotism is the safeguard of independence; it is its bulwark. It is the guardian of the territory of the group, for if the homeland is lost the group is scattered. Patriotism seeks to maintain the integrity of a group; it comes to the rescue when an external attack is threatened and when internal disruption is feared. It works so as to secure the welfare and prosperity of a community. Being based on a partiality or congenital squint of the mind, patriotism tends to engender opposition and animosity in neighbouring groups, and this fosters the jealous and competitive spirit which exists between neighbouring groups. In all these ways patriotism serves as a factor in human evolution. Adam

Smith, in discussing the operations of patriotism as seen among modern nations, has this to say of it: "Independent and neighbouring nations, having no common superior to decide their disputes, all live in continual dread and suspicion of one another. . . . Each nation foresees, or imagines that it foresees, its own subjugation in the increasing power of its neighbours." ¹⁰ I am of the opinion that this description of patriotism among modern nations may be freely transferred to the ancient groups in man's primal world.

Are we to count those prejudiced feelings and modes of action which go to the composition of patriotism as aptitudes which are built into the constitutions of our brains, are ready-made at birth, as it were, or are they merely due to a bent or inclination we acquire as we grow up? My answer is that the predisposition to regard with favour what is our own is an aptitude born in us, but the direction that aptitude takes is a matter of education. Let us take the case of speech; no one will deny that a child is born with an aptitude for speech, but the form of speech is determined by that of its group. I am persuaded that patriotism is of this dual nature. "Patriotism," F. S. Oliver has affirmed, "is mainly instinctive; deliberate reason has nothing to do with it; it affects all classes, rich and poor." ¹¹ "For indeed, who is there alive," asks Swift, "that would not be swayed by his bias and partiality to the place of his birth?" ¹² Lord Kames complains that patriotism "gives the vulgar too much partiality, while it is unbecoming in a man of rank." ¹³ Herein we have set before us the attitude towards patriotism of the educated European of the eighteenth century, an attitude shared by the cosmopolitan-minded of the present time.

If patriotism is inborn, how are we to answer those writers and thinkers who declare they are free from it? Sir Thomas Browne, for example, assures his readers: "I feel not in myself those common antipathies that I can discover in others; those national repugnances do not touch me, nor do I behold with prejudice the French, Italian, Spaniard, or Dutch." ¹⁴ Was Sir Thomas, then, born deaf to the calls of patriotism? Or had he by discipline and reason made himself deaf to its calls? The latter explanation seems the more probable. We must also consider another explanation, that of latency. Darwin has recorded the case of birds in volcanic islands which had no fear of man, but

acquaintance with man proved that their sense of fear was not absent, but only latent.¹⁵ In the piping times of enduring peace, and in city populations devoid of all public spirit, conditions are lacking which call out the impulses of patriotism. In man's primal world, with group contending with group, all the conditions were present to evoke the patriotic spirit.

Patriotism has an ancient lineage; bees give a demonstration of it when they issue to repel invaders from their hive; the gander, when his partner is brooding, turns aggressive; bison bulls form a ring round cows and calves if the herd is attacked. We may regard a group of primal humanity as a brooding community; unless the brood is protected from attack, a group comes to an end. Patriotic feelings and impulses supply the protective armament. Patriotism has also a close similarity to the feelings which exist between members of a family. Partiality, which is the basis of patriotism, reigns within a family; its members resent any imputation made on their conduct or honour, individually or collectively. Group patriotism may therefore be regarded as an expansion of family partiality.

There is another aspect of patriotism which received the attention of Hume.¹⁶ "Men," he noted, "are vain of the beauty either of their country, or their county, or even of their parish. Here the idea of beauty plainly produces a pleasure. This pleasure is related to pride. The object or cause of this pleasure is, by supposition, related to self, the object of pride. By this double relation of sentiments and ideas, a transition is made from the one to the other." Hume might well have continued his argument by pointing out that a man may transfer pride in himself to pride in the group of which he is a member, or might enhance his personal pride in the reflected glory of his group. The argument goes much deeper than Hume carried it, for we shall seek to prove in a future essay that a tribesman extends or transfers every one of his own emotions and instinctive impulses from himself to his tribe or group (see Essay IX). Take the strongest of a man's instinctive impulses—that which compels him to protect and preserve his own life. This impulse to preserve himself he transfers to his group or tribe. Self-preservation is individual patriotism; when the preservation impulse is transferred, it becomes group patriotism. The group impulse, in the throes of war, masters the strongest of individual impulses

or instincts, that of self-preservation; at this present time (February, 1945) millions of men are proving its mastery by dying that their homelands may be preserved.

Fear has an important relation to patriotic feelings; fear is the sentinel of patriotism. In quiet times when no enemy is in sight and no danger threatens, group feelings are in a state of calm. But when the life of a group is threatened, when danger becomes imminent, then fear appears and stirs the patriotic feelings into activity. If the peril is great, then patriotism becomes a master passion. Mr. C. R. Aldrich¹⁷ sees in fear the basis of patriotism, whereas I regard fear as merely the stimulus or "trigger" of patriotism.

Religion and patriotism touch each other at many points; both are nursed by emotions which lie close together in man's mentality. Religion seeks for immortality in another world, whereas patriotism, by working for the perpetuation of its group, seeks for an immortality in this. Early religion worshipped ancestors; patriotism has under its care the dead, the living, and the unborn. "Patriotism," said Oakesmith,¹⁸ "turns doubt into devotion; it moves men to a passionate self-surrender." Religion has the same power. Prichard¹⁹ relates that the natives of Dahomey of his time worshipped their king as their god; they "recognized his divine right to dispose of their persons and lives according to his unrestrained will." In modern Japan patriotism reached the same divine heights; the Emperor was both god and king. In Joan of Arc religious zeal became frenzied patriotism. The ancient Greeks mixed their religion with their patriotism (H. A. L. Fisher). The Marquis of Halifax (1620-92) recognized the kinship of patriotism to religion when he wrote: "Our Trimmer is far from idolatry . . . in one thing only he cometh near it, his country is in some degree his idol . . . but for the earth of England . . . there is divinity in it." Elsewhere I have sought to prove that patriotism has a more powerful sway over the human heart than has religion (*Essays on Human Evolution*, 1946, p. 68).

The line which separates the subjects dealt with in the preceding essay under the term "group spirit" and those discussed in the present essay under the heading of "patriotism" is thin and somewhat shadowy; yet, in the main, group spirit is made up of these feelings and impulses which are concerned with the formation and maintenance of groups, while those included in

patriotism have to do with defence of groups. Both group spirit and patriotism have this in common : both are based on an inborn biasing of the mind, on a partiality so strong that the affairs of the home group are seen in one light, while those of neighbouring groups are viewed in quite another light. The mode of conduct which the home tribesman commends when extended to neighbouring groups, he bitterly resents when applied to himself or to his group. The tribesman's sense of justice automatically obeys two laws—one law for his group and another for other groups. Among all primitive peoples living under tribal conditions in the modern world the tribesman is observed to be a "dual-codist," obeying the "code of amity" in all matters concerning his own group, and obedient to the "code of enmity" in all affairs outside his group or tribe. We may infer that our remote ancestors, working their way to a higher status, were also dual-codists. I shall seek to prove in the next essay that obedience to the dual code is an essential factor in group evolution. Without it there could have been no human evolution. Thus is human evolution based on injustice, and man's mentality has been biased to make him the willing subject of the dual code. Civilization strives, so far with little success, to bring all human conduct within one code—the code of mutual love.

In this essay patriotism has been pictured in its milder mood, in its defensive, non-aggressive form. But just as a man's personal pride may mount into the heights of vanity, so may a group's patriotism become inflamed and passionate, reaching the aggressive state known as chauvinism. This aspect of patriotism will come up for further consideration when nations and nationalism are dealt with in a later essay.

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ESSAY VII

HOW CO-OPERATION WAS COMBINED WITH COMPETITION TO SERVE AS A FACTOR IN HUMAN EVOLUTION

Synopsis.—The *Origin of Species* gave rise to the impression that the methods of evolution were brutal. When Darwin came to write *The Descent of Man*, he emphasized the importance of group selection. Group selection favoured the growth of man's "good" qualities. Co-operation and mutual aid have high survival values. Pioneers of group selection. Man's co-operative impulses have been evolved from an instinctive basis. Man the most consciously co-operative of all animals. Man's "competitive complex." Group or team competition has a strong attraction for man. It is assumed that the human groups in the primal world were competitive to a varying degree. Man is the most competitive as well as the most co-operative of social animals, and in primitive groups these two qualities were combined so as to form a single evolutionary instrument. In this, the author is in agreement with Professor Allee. The combination of co-operation is possible only in groups in which behaviour is regulated by a dual code of conduct. Primitive man was unconscious of his dual morality. A dual standard of justice is essential for group evolution. Early humanity is assumed to have been under the dual code. Group selection implies an "ethical" injustice.

THE general impression created by the *Origin of Species*, when it was published at the end of 1859, was that evolution was a brutal process involving individuals in a lifelong struggle with one another for survival. Such an impression was in keeping with the picture Thomas Hobbes (1588-1679) had painted of man's early state—namely, as a "war of everyman against everyman."¹ Certainly, when writing the *Origin of Species*, Darwin did emphasize the individual struggle and the ruthless nature of the evolutionary process, as, for example, when he penned the last

sentence of chapter VIII, part of which reads: "one general law leading to the advancement of all organic beings—namely, multiply, vary, let the strongest live and weakest die." Even as late as 1888 we find Huxley writing: "As amongst these so among primitive men . . . life was a continual free-fight, and beyond the limited and temporary relations of the family, the Hobbesian war of each against all was the normal state of existence."²

When Darwin came to write *The Descent of Man* in 1870, his conception of the process of evolution had undergone a profound, but apparently an unnoted change; group selection now replaced individual selection—at least so far as social animals were concerned, and most animals are social. I have already cited passages from *The Descent of Man* illustrative of this changed attitude (p. 12), and now I shall cite others to exemplify Darwin's conception of group evolution. Here is my first example:³ "For those communities which included the greatest number of the most sympathetic members would flourish best and rear the greatest number of offspring"; the group or team held together by mutual sympathy is stronger than one not so blessed. Another instance:⁴ "When two tribes of primeval man, living in the same country, came into competition, if (other circumstances being equal) the one tribe included a great number of courageous, sympathetic, and faithful members, who were always ready to warn each other of danger, to aid and defend each other, this tribe would succeed better and conquer the other"; group selection thus favouring the growth of fidelity and courage. A third passage:⁵ "A tribe including many members who, from possessing in a high degree the spirit of patriotism, fidelity, obedience, courage and sympathy, were always ready to aid each other, and to sacrifice themselves for the common good would be victorious over most other tribes." As a postscript to this passage Darwin adds: "And this would be natural selection." Here, then, is a case of group selection which is certainly "natural," but in its methods and results it differs altogether from the instances advanced in the *Origin of Species*.

I shall note very briefly other mental qualities which Darwin regarded as giving strength to a group or tribe, and also those which he believed led to their undoing. "A tribe which was contented and happy flourished better than one which was dis-

contented and unhappy ";⁶ " selfish and contentious people will not cohere and without coherence nothing can be effected ";⁷ " no tribe could hold together if murder, robbery, treachery were common." ⁸ Thus Darwin came to see that it was not a man's individual merits that gave him survival in primal times; all depended on how such a man could fit his merits into the social life of his group. Darwin realized very clearly that a group of primitive mankind was a nursery of all social virtues, and that it was by group selection that man had come by all those mental and moral qualities which have raised him so high above all other animals.

I must not permit my readers to forget the object of my present search; it is to discover the mental qualities which we may legitimately attribute to the human groups we have assembled on the chequerboard of the primal world. In the two preceding essays I have given grounds for attributing to them a " group spirit," and a spirit of patriotism; and now, with Darwin's aid, I am giving my reasons for regarding them as co-operative societies, for in societies or tribes where fellowship, goodwill, and a team spirit prevail, then there must be co-operation. The recognition that the group and not the individual was the unit of selection brought a new principle into evolution. Russel Wallace was the first (1864) to perceive that human evolution was a matter of group selection;⁹ Bagehot recognized it;¹⁰ so did Herbert Spencer¹¹ and Sutherland;¹² but the witness I would cite now is Winwood Reade, because his evidence is based on experience among primitive peoples—those of West Africa. " But this sympathy," wrote Reade in 1872, " is extended and intensified by the struggle for existence; that herd which best combines will undoubtedly survive, and that herd in which sympathy is most developed, will most efficiently combine. Here, then, one herd destroys another not only by means of teeth and claws, but also by means of sympathy and love . . . in the first period of the human herd, co-operation was merely instinctive, as in baboons." ¹³

Karl Pearson was also aware (1888) of the important role taken by co-operation as a factor in the survival of human communities,¹⁴ but the old conception of evolution being a " tooth-and-claw " business must have remained vigorous, for when Prince Kropotkin published *Mutual Aid: a Factor of Evolution* in

1902, it was received as a revelation. In one sense it was a new doctrine, for it attributed man's rise in the animal scale to his capacity for "mutual aid." Such a surmise will explain man's good qualities but, as we shall see presently, we have also to account for those which are regarded as evil.

A leading authority on animal psychology, Prof. W. C. Allee, affirms that "automatic co-operation is a fundamental principle of biology";¹⁵ equally fundamental is the fact that the co-operative activities of a community are restricted to that community. Further, co-operation, so far as the higher animals are concerned, can exist only if members of a community are united by the bonds of mutual affection, sympathy, and goodwill, and, as these emotions and feelings never extend beyond the limits of an animal or primitive human society, we may infer that, so far as concerns the primal groups of humanity, co-operative activities were equally restricted. "Social animals," said Darwin, "are largely guided by special instincts in the aid which they give to the members of the same community; but, they are likewise in part impelled by mutual love and sympathy, assisted apparently by some amount of reason."¹⁶ As he penned that sentence Darwin must have had in mind the enormous expansion of man's feelings, sympathies, desires, and imaginings which took place as the human brain rose in organization and power, and the thousand and one ways in which men could then co-operate and give mutual aid. Man has the capacity to co-operate far beyond that of any other social animal; we may assume that even early man had this capacity to a considerable degree, and that the primal groups, postulated in the group theory, were independent co-operative units.

Having presented my case for regarding the groups of primal humanity as co-operative units, I now turn to give my evidence for regarding them as competitive units. There is ingrained in man's mental nature a bundle of activities to which we may give the name of the "competitive complex." As the base of this complex lies man's desire for place and power—ambition; as an accessory is that form of resolution known as courage. There are the passions of emulation, rivalry, jealousy, and envy, which served as stimuli or "triggers" to bring the competitive complex into action; competition leads to conflict, and conflict may pass into anger, and anger into violence. Now, everyman is heir to

all these ancient mental qualities—to "a greater or lesser degree. We are apt to think that those feelings and impulses serve the occasions of only the individual man, but we have already noted (p. 51) that all man's individual passions and impulses may pass into collective action on behalf of the group. This is especially true of the competitive complex; man's love of team competition is as strong as that for individual against individual. In 1944 the sale of war saving-certificates was going badly in Britain, but the moment one team of collectors was set against another there was a triumphal increase. When the Government of Russia wished to stimulate a desire for learning among its students, it appealed to the competitive spirit by setting the students of one institute against those of another, in what were called "socialist competitions." The desired effect was attained.¹⁷ Games in which teams compete against teams are the most popular form of sport in the Anglo-Saxon world; they seem to satisfy the "competitive instinct" which is so strongly developed within the Anglo-Saxon breast. We may assume that early man had the spirit of team competition.

In man's primal world the stage was certainly set very favourably for a great game of competition. Each group was a separate entity, with its own interests, which were antagonistic to those of neighbouring groups. It may be thought that in a thinly populated primitive world, groups would be so far apart that their interests could not clash. In primal times groups depended for a subsistence on the natural produce of their territories. In those areas where Nature's harvests were abundant we should expect the groups to multiply in size and in number and so encroach on each other. Even then the degree of competition which would ensue must have depended on the temperament of adjacent groups. Among the aboriginal tribes of Australia the competitive spirit is in abeyance; it is kept just sufficiently active to maintain tribal isolation and integrity. It was otherwise with the tribes of Mongolia and of Germany; between tribes in these two regions of the globe there were rivalries, conflicts, and wars. We may assume that in the ancient world, as in the modern, there were regions where tribes were aggressively competitive and others where life was held on easy terms.

Man is the most competitive of animals; his spirit of competition outstrips that of every other Primate just as far as his brain

surpasses theirs. Competition, one would infer, has been an important factor in man's evolutionary ascent. Man is also the most consciously co-operative of all animals; we may confidently assume that his co-operative capacity has been a potent factor in his evolutionary progress. Modern men of business are of the opinion that co-operation and competition are incompatible forms of human activity. Yet every successful football team shows that such a combination is not only possible but highly profitable. For unless a co-operative spirit prevails among the members of a team, unless each man sinks his individuality in his team, there can be no competitive strength; the higher the co-operative spirit, the greater the competitive power. The greater the opposition met with in competition, the greater grows the co-operative spirit within the team. I assume that it was in this way that co-operation was combined with competition in the human groups of the primal world; welded together, as in a team, they gave a human group a strong place in the evolutionary field. In all home activities of a group co-operation replaced individual rivalries, but in all affairs which concerned the outside affairs of the group the "competitive complex" had free play. I regard the combination of co-operation with competition as the most potent of all the agencies which determined the evolutionary destiny of human groups.

That groups of primitive humanity should be imbued with a team spirit, and should have forged out of co-operation and competition a single and effective instrument to serve in their evolutionary advance, seems an almost trite idea, yet in all my reading I have come across only one author who has given it a clear expression—namely, Prof. W. C. Allee.¹⁸ As to the factors which are concerned in the natural production of new forms of organic beings, I find that I have more in common with him than with any other biologist, excepting his idea that evolution should culminate in making mankind into a single co-operative community. Julian Huxley, in his comprehensive work on evolution,¹⁹ seems to have had in mind a combination of competition with co-operation when he wrote: "The development of social life, with consequent inter-group struggle within the species, may produce the most peculiar selective results, as is especially to be seen within our own species"—a statement based on inferences made by Dr. R. A. Fisher, who gives reasons for

believing that selection, which is competitive in nature, tends to produce co-operative mental qualities, such as public spirit and patriotism.²⁰

Now, in order that the members of a team may apply the "C.-and-C." factor (competition with co-operation), they must have two rules or codes of conduct: they must behave in one way to their fellow members, but in quite another manner to members of the opposing team. It must have been so with groups of primitive humanity: the members of a group had one rule of conduct for their fellows and quite another for members of neighbouring groups. This duality of behaviour is not peculiar to man; it holds for all neighbouring groups of social animals. Duality of conduct is made possible because the mentality of all social animals is dual. It is especially true of human mentality; the man who loves, sympathizes, and is kind at one moment may hate, be callous and cruel at the next; in man's mental armoury every virtue has its corresponding vice. "Rude tribes and civilized societies," said Herbert Spencer,²¹ "have had continually to carry on an external defence and an internal co-operation: external antagonism and internal friendship. Hence their members have acquired two different sets of sentiments and ideas, adjusted to their two kinds of activities."

Here, I think, the pioneer of evolutionary thought places the cart before the horse. Man did not acquire his dual mentality as a result of practising two codes of morality, but he practised a dual code because of the twofold organization of his nervous system. A bee behaves in one way to its fellow workers, but in an altogether different way to those who are not of its hive. The bee's behaviour is regulated by instinct, and instinct depends on an innate organization of nerve cells. Man is the descendant of a remote ancestry, the conduct of which was regulated by instinct. On this instinctive basis man's powerful brain has been evolved, but the fundamental dualism has been retained.

The bee, of course, is not aware that it has two rules of conduct, two standards of justice, nor is any social animal. Only man has become conscious of it, and he only when he has entered the realm of high civilization. The daily conduct of most men is based on a dual code; it seems to them so natural to love their friends and to hate their enemies that they believe that they are obeying only one moral code in doing so. If, as I have assumed,

man's mentality has been built on an instinctive basis, then this unconscious practising of a dual code is understandable, for instinctive action lies below the level of conscious control. Even in the human brain, when impulses ascend into the field of consciousness—into the eye of the mind—from the old centres of instinct, they bring with them such an emotional force that reason, far from playing the part of judge, jumps down from its throne to become a partisan. Conscience sits unmoved, believing such occurrences to be in the normal order of events.

I am assuming that ancient, evolving humanity was dual minded and had two codes of behaviour. For a moment let us suppose that it was not so and that there was only one code, the code of amity or co-operation. Then the sympathy of the members of a group would no longer be restricted to their own circle, but would well out to embrace members of all neighbouring groups. If a group no longer considered its own things much more precious than those of other groups, in no need of defence, then patriotism would be superfluous; if men and women behaved towards members of other groups as they did towards members of their own group, then all barriers between them would vanish and a general fusion would ensue. And with the disappearance of groups, not only competition and conflict would be eliminated, but co-operation as well, for groups are the nurses of co-operation as well as the agents of competition. If students of evolution are right in regarding each isolated group as an experimental brood, then with the dissolution of the dual code such broods would be brought to an end. What direction would human evolution have taken if man had been uni-codal? I cannot tell, but it would have been very different from that it did take under the rule of the dual code. Evolution would certainly have become disorganized, indeterminate, and inchoate, as indeed it is becoming in the modern world. And, after all, man is a very exceptional result for evolution to have attained under the stress of competition and of elimination.

Seeing that all social animals behave in one way to members of their own community and in an opposite manner to those of other communities, we are safe in assuming that early humanity, grouped as it was in the primal world, had also this double rule of behaviour. At home they applied Huxley's ethical code, which is Spencer's code of amity; abroad their conduct was that of

Huxley's cosmic code, which is Spencer's code of enmity. The subservience to these two codes—co-operation within groups and competition between groups—made evolutionary advance possible; and we may infer that the groups which co-operated best were also the groups which were most successful in the competition for survival. Man is the most co-operative of animals and also the most competitive; it can hardly be a coincidence that the animal that has risen highest in the scale of beings is the one in which these two qualities find their highest development.

To the ethically minded the practice of the dual code is anathema, for it implies two standards of justice—the favourable standard which members of a group apply to themselves, and the harsh standard they seek to impose on those not of their community. Such is my reason for asserting, at the close of the preceding essay, that evolutionary advance was made possible by the practice of injustice.

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ESSAY VIII

MENTAL BIAS AS A FACTOR IN HUMAN EVOLUTION

Synopsis.—The development of group mentality in the child. The early recognition of faces. The limitation of sympathy to known faces. The early manifestation of mental qualities concerned in evolutionary competition. The development of mental biases concerned in patriotism. The opinions of Locke and of Reid concerning biases connected with the preservation of the individual and of the species. How the modern student of evolution regards these biases or instincts. Hume's approach to the study of human nature and to man's prejudices. The author agrees with Hume in regarding man's inclination or aptitude to form prejudiced opinion as being inborn. The influence of desires, aversions, interest, etc. Hume's cultural prejudice and his inability to account for man's behaviour being regulated by a dual code. The belief that the "species is wise" has a true foundation. Human mentality has been biased to serve as a powerful factor in determining the direction of human evolution. Altruism and idealism as sources of bias. They seem to serve no evolutionary purpose. The evolution of altruism. It is a form of mental disarmament. Theories also serve to bias the minds of authors; this is particularly true of those who write on anthropology.

IN the three preceding essays I have discussed the part played by the mentality of early man in shaping the evolutionary destiny of the groups into which mankind was divided in primal times. The evidence on which my discussion was based was drawn from what is known of the mentality of tribal man in the modern world, and to some extent on what we know of the social behaviour of animals akin to man. There is another source of evidence which I have not yet touched on—namely, that provided by the study of the developing mentality of very young children, particularly of those group-forming qualities which I have ascribed to early man. By the time a baby has entered its fourth

month of life it has become conscious of faces;¹ it distinguishes the known face from the unknown; the known face pleases while the unknown displeases. Have we not in this the first manifestation of the group spirit—a "consciousness of kind," a discrimination which separates the faces of the family community from those not of that community? The babe returns the smile of the known face with a smile, while it is upset by the smile of the unknown face. Sympathy is limited to the known group. Have we not here the beginning of that characteristic of the group spirit—the limitation of sympathy to the home community? To account for the babe's behaviour we have to assume that it has been born with a mental bias—an inclination as well as an aptitude to love the known but to turn away from the strange or unknown. And the purpose of the bias is to serve in group formation. Here, then, is the subject of the present essay—the biasing of man's mentality to play a part in the process of his evolution.

Before the end of its first year a child's affections became biased in opposite directions; in one direction its preferences are so strong that they may be described as love, while in another direction its aversions are of the nature of hate. Thus early is laid the basis of the love-hate mentality which prevails between independent groups of primitive humanity—the subject to which the preceding essay was devoted. With love and hate come manifestations of anger and jealousy, pride and resentment—the main mental ingredients which go to the make-up of the "competitive complex." Seeing how early in life a child's feelings and passions assume this biased mode of action, we must assume that the bias is determined by a particular structure and organization of its nervous system. We may speak of such inborn or innate mental biases as being "instinctive" if they serve a purpose in life's economy.

As to patriotism, a particular form of mental bias or prejudice,² dealt with in Essay VI, we must assign its development and manifestations to a later stage of a child's life than those just mentioned, unless we accept Hume's opinion that a child's concern or pride in itself is a form of patriotism—namely, "self-patriotism." This form of patriotism begins before the end of the first year, but its more usual manifestations appear in later childhood, when a mother becomes to her children the best of women, and father,

the greatest of men. "The nearer in kind the nearer in affection" (Hobbes). Although well over seventy years have come and gone since I nursed the illusions of childhood, I have still a vivid recollection of my dismay when certain of my boyhood prejudices were challenged. My father farmed in the valley of the Deveron, a small river in Scotland which separates Aberdeenshire from Banffshire. He was, in reality, an ordinary farmer, and his livestock was not unusual, but I held the opinion that he was the most expert of farmers and that his stock was of the highest merit. To my surprise I learned, in a moment of confidence from a friend, the son of a neighbouring farmer, that he held a like high opinion of his father and of his father's stock, an opinion that struck me as being absurd. Neither his prejudice nor mine was shaken by our confabulation! Often since then I have thought of the strength which a primitive group of humanity must have drawn from the prejudice or, which is the same thing, the conviction that it was the best and bravest of all groups and that its homeland was the best of all territories. Group pride is a breeder of confidence; it becomes a source of evil only when it reaches that point of fervour or intoxication which is named jingoism or chauvinism.

Often as I read the works of authors of the seventeenth and eighteenth centuries I have felt, as they expounded the fundamentals of human nature, that they enjoyed one advantage which is denied to us who are disciples of Darwin. They believed in Creation. Let me cite one or two examples to illustrate my meaning. Let us begin with one from John Locke (1632-1704): "Our all-wise Maker, knowing what it is that determines the will, has put into man the uneasiness of hunger and thirst to move and determine their wills; for the preservation of themselves and of their species . . . for the continuation of the species."³ Locke has only to call in the Creator to account for all the instinctive forces or impulses we find at work in man's nature, whereas I have to demonstrate that there still exists inside man and outside him forces or powers which could have created human nature as we now find it—human nature with all its bends, biases, prepossessions, and instinctive urges. My second example is taken from the *Philosophy* of Thomas Reid (1710-96): "The wise Author of our Being hath implanted in human nature . . . inferior principles of action . . . to preserve

the species . . . to produce changes and revolutions in the theatre of life . . . hath not trusted reason with the preservation of the species . . . hath not thought fit to leave this important task to reason alone, otherwise the race would long ago have been extinct." ⁴ Here the Scottish philosopher handles in the simple terms of Creation the problem I am now discussing—the inclination of the human mind to certain lines of thought and action, these forces being attributed to "inferior principles of action." The bending or bias has been implanted to serve an evolutionary purpose—namely, the preservation of the species. The "inferior principles of action" ensure that mankind will mate, will engender children, will care for children, and will devote their lives to the rearing of them, will be partial to them, and in due time will sink their own individuality in that of their children. This eighteenth-century conception of human mentality is acceptable to the twentieth-century students of evolution, save as regards two matters: we regard "the inferior principle of action" as coming to man, not by a special act of implantation, but as an inheritance from forebears whose lives were mainly regulated by instinct; we prefer to speak, not of the preservation of the species, but of the preservation of the group.

The preference of the term "group" to that of "species" becomes evident when we recall the main object of this discussion. It is the evolution of the separate groups into which primitive humanity was divided, particularly the part played by biased mentality in the preservation and evolution of primal groups. We have already noted the extent to which the social attributes of the human mind have been biased to serve such purposes; and now we must realize that a group's mentality is even more completely enslaved to serve in the major business of reproduction. Every generation of a group owes its existence to the self-sacrificing labours of a preceding generation, and should, if the group is to continue, hand on the entire trust or capital it has received to a succeeding generation. Our Scottish philosopher adds as a postscript to the passage quoted above that the "inferior principles of action" implanted in man's nature "have been successful hitherto in ensuring the continuation of the race." This is true of humanity as a whole; there is no lack of births. But how many groups and peoples have come to an untimely end just because they spent on themselves the capital of altruism which

should have gone to the rearing of another generation? The strength of the reproductive bias is a guarantee of the survival of a group.

Both Locke and Reid approached the study of human nature under the conviction that they had to deal with a "special creation"—such a conviction serving as a potent bias to their interpretation. There is another author of the eighteenth century whose observations on human nature may help us to interpret the mentality of early man still more accurately than those of his contemporaries—namely, David Hume (1711-76). Hume, who held that "the material world has a principle of order within itself,"⁵ was more likely to err in the direction taken by those who regard human nature as a product of evolution. "Nature," wrote Hume (meaning, as I suppose, the creative powers inherent in living things), "has given all animals a like prejudice in favour of their own offspring; this passion arises from the original structure and formation of human nature."⁶ Here we find Hume affirming his belief that a pronounced bias or instinct is determined by the organization of man's nervous system. "Reason," he declares, "discovers objects as they really stand in nature," while our feelings have "a productive faculty, and gilding and staining all natural objects with the colours borrowed from internal sentiment, raises in a manner a new creation." Primitive man, as the powers of his brain expanded, and as the rigidity of instinct was replaced by a liberality of choice, looked out, not on the world as it really was, but on one made attractive by the glamour created by his inner feelings and by the liveliness of his imagination. Such a bias gave him an incentive to live. According to Hume, "Nature has succeeded in deceiving us into the opinion that human life is important."⁸ Men find surcease from the troubles of life in sleep, which is akin to death, yet so strongly are they biased in favour of life that escape from it by suicide is regarded as an act of insanity. Nevertheless, when men realize that their country or their group is in danger, their instinct for self-preservation is superseded by a still stronger basis—one which compels them to offer their lives in order that their homeland and their group may survive. These instances serve to illustrate the extent to which human nature has been biased to serve evolutionary purposes.

Human mentality may be biased by many circumstances and

conditions. Desires and aversions, unreasoned likes and dislikes, turn our minds this way and that. Especially potent is that form of mental activity known as "interest"; whenever questions concerning our own welfare or that of our community arise, our emotions are aroused and our interest is intensified. A common interest served as a bond to keep the members of primitive groups together and helped to secure unity of action. Hope turns our minds in one direction, while fear, the stronger agent, turns them in another direction. Fear gives unity of action to a group. Our minds are tuned to accept what flatters our self-vanity and to reject what tends to lower our personal status. We are biased or swayed by our national pride. Pride of family and of class bear in upon us. We are ready to believe all that is good of our friends and all that is evil of our enemies. Our minds are enslaved to our prejudices to a far greater extent than is usually recognized.

Hume had a mind of the highest order, penetrated and controlled by an unflinching intellectual integrity; yet he had a ruling prejudice. He valued those elements in human nature which fitted a man to take a place in the polite society of his time. "We are naturally partial to ourselves and to our friends," he admitted; and then adds, "We are capable of learning a more equitable conduct."⁹ When dealing with those mental qualities which make up man's code of amity, which I have discussed in the preceding essay, his pen moved swimmingly; love, friendship, goodwill, taste, tact, easy manners, benevolence, and humanity had his approval because they were agreeable as well as useful. It was when he proceeded to explain the presence in human nature of those qualities which make up man's code of enmity that his style became cramped; the exhibition of passion, of contention, of vanity, of brutish manners, of ambition, avarice, jealousy, envy, and hatred was fatal to all social and polite intercourse, and therefore vicious and bad. Yet Hume admitted that "we cannot diminish or extinguish our vicious passions without diminishing or extinguishing such as are virtuous; and rendering the mind totally indifferent and inactive."¹⁰ He regarded love and hatred as being "due to a constitution of nature of which we can give no further explication."¹¹ Man's code of enmity was an enigma to uni-codal Hume, but that which was an enigma to him finds an easy solution at the hands of the student of human

evolution. Human nature was elaborated and matured in that prolonged primal age of mankind when every human group contended with neighbouring groups. As shown in the preceding essay, man's dual nature was an essential factor in his evolution.

In this essay I have sought to concentrate the attention of my readers on the great extent to which the mentality of primitive man was modified and biased to serve in the welfare of his group, which means, ultimately, in the welfare and evolutionary destiny of his race or species. We may assume, I think, that a steady process of selection went on among the groups of primitive humanity, and that the groups with minds most suitably biased to give a united team or group spirit would be the groups rewarded by the prize of survival. If my argument is sound, then may there not be truth in what has come to be known as "wisdom of the species"? In this connection statements made by Edmund Burke (1729-97) are often quoted. For example: "Whenever the people have a feeling, they are commonly in the right."¹² Or again: "Prejudice with its reason has a motive to give action to that reason and an affection which will give it permanence. Prejudice is of ready application in an emergency. . . . Through just prejudice a man's duty becomes a part of his nature."¹³ Here we find an able statesman justifying prejudice in a modern society, while I am dwelling on its evolutionary utility among ancient societies of evolving man. Aristotle seems to have believed in the collective wisdom of lower animals. In his *Ethics* this passage appears: "Even in the lower animals there is some natural good principle above themselves which aims at the good peculiar to them."¹⁴ Darwin believed that the safety of a tribe lay in the guidance of tribal opinion. For example: "Actions are good or bad as they affect the welfare of the tribe. . . . Judgment of the tribe is best in the long run for all its members."¹⁵ The part played by all those mental activities, which are of an instinctive or biased nature, in the preservation of the individual or the species, and in securing the perfection of the species, was very completely recognized by E. von Hartmann (1842-1906).¹⁶ James Dunbar, a professor in the University of Aberdeen, penned this epigrammatic statement in 1781: "Instinct carries out the policy of nature."¹⁷ If we construe "the policy of nature" as being the way of evolution, then we may

say that the human brain has been evolved to serve as a factor in carrying out that way.

There remains for our consideration one of the most powerful inclinations or biases of the human mind—that which receives a multitude of names—altruism, idealism, humanitarianism, benevolence, and many others. Altruism gives rise to a feeling of serenity. It is destitute of self-interest, is non-competitive, and apparently serves no evolutionary purpose; its field of action is entirely within the code of amity; it aims at a higher and better life. Altruism is the mother of all forms of missionary enterprise. Benevolence, wrote Hume, "is a disposition, a bias, a generous concern for our own kind"—our own kind meaning here the whole family of mankind. Altruism is accompanied by that degree of emotional fervour known as enthusiasm. "Enthusiasm," said Hume, "arises from pride, hope, presumption, a warm imagination, together with ignorance."¹⁸ Under a heightened degree of zeal, altruism may assume the ugly forms of bigotry or of fanaticism. "Ideals," William James noted, "give inner joy, but are luxuries if they stay at that."¹⁹ In the opinion of Herbert Spencer ideals may intoxicate the judgment; "they may strain nature out of its inherited form."²⁰

Having asserted that all instinctive tendencies of the human mind work for the preservation of the individual or of his community, how are we to account for one which serves no such purpose? I agree with Wilfrid Trotter²¹ that altruism is both inborn and instinctive. The explanation of the origin of altruism which I would offer is very similar to that given by Darwin.²² Altruism is a vast expansion of family sympathy. Family sympathy has a diffusive and exuberant quality; it becomes wider and wider in its influence, until it includes all members of a primal group; it again expands when groups are fused into tribes and again when tribes are combined to form nations. The peoples that have survived to form the large nations of modern times are those which were gifted with a full endowment of generous sympathy, a quality nearly akin to altruism.

Such, however, is only part of the explanation I have to offer for man's altruistic qualities. In reality, altruism is an evolutionary disarmament. All the emotions which wait upon the practices concerned with man's evolution are painful. Competition, contest, emulation, rivalry, hatred, anger, cruelty,

injustice—in short, all of those feelings included in the “evolutionary complex”—give rise to uneasiness and anxiety. Altruism signifies a complete abandonment of the evolutionary outlook; the altruistic man or woman is willing to sacrifice self for foe as readily as for friend; altruism, in reality, is a longing for peace. Hence the warm, large-hearted feeling which accompanies it.

I am particularly interested in a form of mental bias which has its place, not in the evolution of man, but in the evolution of science, especially the branch of it which most nearly touches me—namely, anthropology. Time was, and not so long ago, when the ruling bias of my predecessors was the theory of creation as expounded by Moses. Observations which did not fit into that theory were rejected or modified. And now we are dominated by the conviction that evolution is true, and I am bound to confess that so far as the workings of Nature are known, our observations, so far as they concern man, fit very comfortably into that theory. Alas! many of these observations cannot be fitted into our conception of what civilization is, and especially what it ought to be. Hence many of my colleagues, votaries to the altruistic ideal of a universal brotherhood, refuse to handle the uglier aspects of the evolutionary process as manifested in the world of to-day. The actions of the living nations lie outside their purview, yet to me the behaviour of nations now alive is very similar to that which I have ascribed to primal groups of humanity, swallowed up in the past of so long ago. “The profoundest of all infidelities,” write Herbert Spencer, “is the fear that the truth will be bad.”²³

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ESSAY IX

RESENTMENT AND REVENGE AS FACTORS IN HUMAN EVOLUTION

Synopsis.—The author's reasons for attributing the feeling of resentment and the practice of blood-revenge to the primal groups of humanity. Resentment and revenge as manifestations of the individual. As manifestations of a group. The principle of collective responsibility is involved. Revenge is suppressed within a family circle; when a family feeling spreads so as to include the whole group it is also suppressed within the group. Revenge fits into the evolutionary code of enmity. How revenge was regarded by authors of the Darwinian period. Murder of a tribesman by an enemy is regarded as an injury to the whole tribe. The practice of blood-revenge by the earlier Israelites. The law of retaliation. Blood-revenge is practised in all populations which are divided into separate, independent groups or communities. Head hunting; the effects of suppressing the practice. Natives living under "wild" conditions still retain their zest for life. Revenge, as a tribal practice, is more frequently praised than condemned. The role of resentment and of revenge in bringing about evolutionary change. Duelling as a form of revenge. Why the feelings connected with the code of enmity are unpleasant, while those connected with the code of amity are pleasant.

In the four preceding essays I seem to have been swayed by a double purpose—first, to give an explanation of human nature, and, second, of the part played by human nature in the evolution of the groups into which early mankind has been divided. In this essay I am still shadowed by the same duality; I am to assume the existence in early mankind of those mental qualities we name resentment and of its dynamic sequel, revenge; and on this assumption proceed to explain their role in group evolution. When it is remembered that these two mental qualities are found in all the higher vertebrates, particularly in those which are akin

to man, it is a reasonable assumption to presume their presence in primitive humanity. This assumption is supported by the fact that the human child manifests the feeling of resentment before the end of its eighth month of life;¹ its early appearance may be taken as evidence that the feeling is not copied, but is inborn. Then there is a third source of evidence—that supplied by living primitive peoples of the modern world. Resentment, as a mode of feeling, and revenge, as a mode of behaviour, are to be seen in operation in all native peoples, among whom we may note the part they play in regulating the lives of individuals and of groups. We may transfer, I think, observations made on such communities in the modern world to those which existed in the primal world. Such is the purpose of this essay.

The twin qualities we are discussing may serve the needs of the individual or they may be evoked by the needs of a group. Let us consider, first, the manner in which they serve individual needs. A man's feeling of resentment is aroused when he suffers a deliberate injury to his person, to his mind, to his reputation, or to his honour; it arises when his will is thwarted or his prospects damaged; or it may arise when he suffers an injustice or when he has been outwitted by a rival. The injured man may call reason to his aid, and by strength of will suppress his feeling; or it may pass into hate, and so be postponed. Or resentment may burst into flame and pass beyond control; all the forces of anger are automatically mobilized and the will is forced into physical action. By the infliction of an equal or greater injury, resentment is allayed or gratified. If the act of reprisal is made while the sufferer's anger is still hot and is of a like kind to that received, we name it retaliation; if postponed and urged on by hatred, we call it revenge. In all these cases resentment and revenge serve to give protection, or some measure of justice, to the individual. They may be said to serve an evolutionary purpose.

Resentment may be occasioned, not by an injury done to an individual, but by one done to a group or clan. We have already noted how all the feelings which serve to preserve the individual or to promote his interest become expanded to work for the preservation and welfare of his group. Pride in self becomes pride in group. So it is with resentment; a common feeling comes into existence in all members of a group when their community is attacked, when its honour is impugned, its prospects

damaged, or its will thwarted. The sequence of events may be that which I have described in the case of the individual. The result may be an inter-group warfare, for I am of opinion that group revenge was the first form of human warfare. Among the aborigines of Australia, if a tribe is small, all its members are involved in any act of revenge; but if the tribe is large and scattered, the turmoil is confined to local groups; two groups of the same tribe may carry on a vendetta.²

There is an important principle underlying the practice of group revenge which I have not mentioned so far. It is the principle of collective responsibility, which works in two ways: it compels the group to avenge a wrong done to any one of its members; it makes the group responsible for trespass committed by any of its members. Group revenge is linked with group responsibility. It is easy to see the advantages which such a linkage will bring to a group: it will give unity of feeling and of action to all its members; it will bring a group its own measurement of justice; and it will restrain unruly and offensive conduct on the part of its individual members. It is not the utility of this group ordinance I am concerned with at this moment, but the circumstances which brought it into being. We get a clue if we consider the conditions which prevail within a primitive family, which I may define as consisting of a man and woman, their children and grandchildren, all living, eating, and sleeping as one company. Now the members of a family are bound together by what is usually described as "natural affection"; the code of amity regulates the conduct of the members of a family towards one another (see Essay V, p. 44). Nevertheless a feeling of resentment does arise between members from time to time, and if allowed to pass into revenge would speedily bring about the destruction of the family. If resentment does pass into revenge in the case of a family, then punishment of the erring member becomes a duty of the family; such punishment is not an act of revenge. We have already seen how the family spirit expands beyond its narrower circles until all families of a group are made into a corporate whole. The family law then holds for the whole group. The duty of punishing crime and wrongdoing falls on the group, so far as its own members are concerned, but if the wrong is committed by someone outside the group, then the law of revenge becomes operative. So we come back again to the

action of the dual code—the code of amity which regulates the “home” conduct of a group and the code of enmity which determines conduct in all its “foreign” affairs. Within the group the law of revenge is suppressed; outside the group it is given a rigorous enforcement. Thus the law of revenge nurses enmity between groups, and so serves to maintain their isolation. Isolation, we shall find, has been an important factor in human evolution.

Readers may suspect that the statements I have just made about revenge have been fashioned to fit into the theory of evolution. Let me cite, then, the evidence of polite authors who wrote in pre-Darwinian times. In the fourth essay of a series which Lord Bacon (1561-1626) published in 1626, he said this of revenge: “Revenge is a kind of wild justice, which, the more man’s nature runs to, the more ought law to weed it out. . . . Certainly, in taking revenge a man is but even with his enemy, but in passing it over he is superior, for it is a Prince’s part to pardon.” Bacon’s condemnation of revenge relates to life in civilized lands; here we are concerned with the part played by blood-revenge among the uncivilized of the primal world. Adam Smith (1723-96), in the *Theory of Moral Sentiments*, published in 1759 and written while he was still in his “thirties,” deals with revenge, not as a vice, but as a virtue with which primitive man was endowed. Here are two of his statements: “Though man be naturally endowed with a desire of the welfare and preservation of society, yet the Author of nature has not entrusted it to his reason to find out that a certain application of punishments is the proper means of attaining this end; but has endowed man with an immediate and instinctive approbation.”³ Elsewhere Adam Smith has this to say of the spirit of revenge: “Nature, antecedent to all reflection upon the utility of punishments, has in this manner stamped on the human heart an immediate and instinctive approbation of the sacred and necessary law of retaliation.”⁴ The author of the *Wealth of Nations* regarded the spirit of revenge as an inborn constituent of human nature and as an instrument of primitive justice. Thomas Reid (1710-96), who succeeded Adam Smith in the chair of Moral Philosophy in the University of Glasgow in 1765, wrote of resentment and revenge thus: “Nature disposes us to resent injury to self, family, friends, and our community. . . . Resentment is a penal statute, promulgated by

nature; the execution of which is entrusted to the sufferer; an uneasy sensation urges the execution." ⁵ Still earlier in the eighteenth century Bishop Butler (1692-1752) recognized that resentment was "a weapon put into our hands against injury, injustice and cruelty." ⁶ These eighteenth-century authors were creationists; we who are evolutionists use different terms, but our ultimate meaning is the same—namely, that the feeling or passion we call resentment, and which precipitates the action of revenge, is inborn in man and makes him the executioner of his private sense of justice.

The quotations just given bear upon vengeance as an instrument of law: "Time was," writes Tylor, "when it was every man's duty to take the law into his own hands." ⁷ The same authority emphasizes the important point that many primitive tribes, such as those of Brazil, regard the murder of a tribesman by an enemy as an injury to the whole tribe. He also illustrates the penalties which overtake the tribesman who fails in his duty as avenger by an example taken from tribal life among the Australian aborigines. "The holiest duty a native is called on to perform is to avenge the death of his nearest relative." ⁸ His failure is attended by a complete social ostracism, and he becomes a mark of tribal scorn. Among the Nyasa Bantus the clan which fails in the duty of revenge is looked down upon by neighbouring clans; its honour is tarnished. ⁹ Arab tribes also regard murder of a member as an injury to the whole tribe; "our blood has been spilt," it is said. ¹⁰ When a tribe is led by a chief the duties of protection and of vengeance fall on him; ¹¹ with the coming of kings, these duties were transferred to them; from kings it is an easy step to transfer these duties to God himself. Murder came to be construed as an offence against God.

The practice of blood-revenge among the earlier Israelites is illustrated by many passages in the Old Testament. The practice must have been rife when they settled in Palestine, otherwise it would not have been necessary to institute cities of refuge to protect the culprit from the avenger. "The revenger of blood shall himself slay the murderer, when he meeteth him he shall slay him." ¹² God's instructions to Noah were: "At the hands of every man's brother will I require the life of man. Whoso sheddeth man's blood, by man shall his blood be shed." ¹³ The law of retaliation was given by God: "Eye for eye, tooth for

tooth, hand for hand, foot for foot, burning for burning, wound for wound, stripe for stripe."¹⁴ In the following passage collective responsibility is recognized, and so is jealousy, as a cause of resentment and revenge: "For I the Lord thy God am a jealous God, visiting the iniquity of the fathers upon the children unto the third and fourth generations of them that hate me."¹⁵ We see the law of revenge at work in the heart of King David as he lay on his death-bed. He entrusted to Solomon the duty of carrying out two acts of revenge he himself had been unable to execute because of an oath—one on Joab the son of Zeruah, the other on Shimei the son of Gera. As regard the latter the instruction was: "But his hoar head bring thou down to the grave with blood." One other instance from Proverbs¹⁶ is instructive because it illustrates vengeance arising from sex-jealousy on the part of a wronged husband: "For jealousy is the rage of a man; therefore he will not spare in the day of vengeance. He will not regard any ransom." Bacon was right when he described revenge as a form of "wild justice."

The practice of blood-revenge is present in every population that is divided into clans or tribes. The practice springs from, and is allied with, the code of enmity which regulates inter-tribal conduct. Hence the practice is endemic in all those parts of the earth where a tribal or group organization is retained. It prevails in North Africa, in Arabia, and in the Balkans, especially among the Albanians and Montenegrins. The Albanian tribesmen set a higher value on honour than on life;¹⁷ a stain on honour can be wiped out only by blood.¹⁸ When a clan organization prevailed in Ancient Greece, blood-revenge was "an absolute and immediate obligation."¹⁹ How thoroughly the duty was performed is indicated by the old Greek adage: "A man is a fool if he kills the father and leaves the children alive." Among the Highland clans of Scotland there were interminable contentions and rivalries; violent animosities prevailed between their chiefs; the practice of blood-revenge was rampant.²⁰

Although the incentives which lie behind head-hunting, the collection of scalps, and the capture of victims for sacrifice, differ from the feeling of resentment which underlies the practice of blood-revenge, yet the results they produce in the relationship between groups are similar. As victims have to be obtained from outside or enemy clans, the result is that the animosity between

tribes or clans is heightened and rendered more virulent and lasting, thus assisting to maintain the separation of evolutionary units. Head-hunting is regarded by natives as a proof of manliness.²¹ That it gives a zest and excitement to life may be inferred from the change which comes over the mentality of a group when its head-hunting habit is suppressed. Mr. E. W. F. Chinnery,²² who was a resident magistrate in New Guinea, noted that "the native feels a void in his existence" and that his chief occupation was gone "when the old practice could no longer be followed." Mr. G. Pitt-Rivers declares that "natives deprived of war and head-hunting lose their chief interest in life."²³ Rajah Brooke succeeded in pacifying the head-hunters of his dominion by inducing them to use a "dummy" head instead of a real one.²⁴ Throughout the whole region of Australonesia magical means are used as instruments of revenge.

The conditions of life described in the two preceding paragraphs, when viewed by civilized eyes, seem so revolting as to be utterly unbearable. Yet those who have visited peoples living under a reign of "wild justice," bring back accounts of happiness among natives living under such conditions. Freya Stark, for example, reported thus of South Arabia: "When I came to travel in that part of the country where security is non-existent, I found the people, though full of lament over their life of perpetual robbery and blackmail, yet just as cheerful and as full of the ordinary joy of living as anywhere on earth."²⁵ Dr. H. K. Fry had a similar experience among the aborigines of Australia. "A native in his wild state," he reports,²⁶ "lives in constant danger; hostile spirits are about him constantly. Yet he is light-hearted and cheerful . . . indulgent to his children and kind to his aged parents." My third illustration is taken from the Crow Indians of America, who have been under the eye of Dr. R. Lowie for many years. They are now living in the security of a reserve. "Ask a Crow," reports Dr. Lowie, "whether he would have security as now, or danger as of old, and his answer is—'danger as of old . . . there was glory in it.'"²⁷ I am assuming that the wild conditions of life I have been describing were those amid which mankind lived through the whole of the primal period of its evolution. It was amid such conditions that man's nature and character were fashioned, one of the conditions being the practice of blood-revenge.

When I count up the opinions which have been passed on the practice of blood-revenge, I find the commendations outnumber the condemnations. Let me deal with the grounds of commendation first. Hobbes commends it in his seventh law of Nature for the reason that "men look not at the greatness of the evil past, but the greatness of the good to follow."²⁸ Revenge is preventative in its action; fear of fiercer reprisals restrains. It is commended as a test of courage and of the will to duty. It gives solidarity to a group and unity of action. It serves, in the eyes of the participants, to maintain tribal honour and prestige. It gives a sense of collective responsibility to a group, and compels it to restrain its wayward members. On the other side of my account I find the practice of revenge condemned as being savage, brutal, inhuman, a destroyer of peace, filling life with hostility and hatred; it leads to a waste of previous lives; it is a childish passion (Trotter); it is the strongest passion of the savage breast (Machin). The savage has one opinion of the practice of revenge; the civilized man quite another. Certainly the practice of blood-revenge is incompatible with a civil way of life.

How, then, do resentment and—the natural issue of resentment—revenge fit into the group scheme of human evolution? Let us first consider the problem of group selection. We shall find, in a future essay, that isolation is an essential condition for group evolution. The practice of blood-revenge creates a very permanent barrier between neighbouring groups or tribes. If a group refuses, or has not the courage, to defend its members wilfully attacked from without, it will lose, not only its place in esteem, but also its life. If we consider the selection of individuals, which make up a group, the same case holds. The man who shirks his duty when revenge knocks at his door suffers a moral death in the eyes of his community. We who live under the shelter of law may suppress our resentment and so escape, but the tribesman was given no such shelter; he had to be strong enough in mind and body to shoulder his own defence. The strong and resolute were thus favoured in tribal times.

Duelling is a form of revenge; it is a "wild" search for justice conducted according to an accepted set of rules; it is a return of evil for evil between two individuals of the same group or company, one of whom considers that his reputation or honour has been injured. Hobbes gives an excellent account of the

conditions which occasion a duel: "A man receives words of disgrace or some little injuries and is afraid, unless he revenge it, he shall fall into contempt, and consequently be obnoxious to the like injuries from others."²⁹ Here Hobbes overlooks the fact that duelling, like the practice of blood-revenge, is enforced by the opinion of the company or society to which the duellists belong; unless the duty is undertaken, the duellists or avenger loses his reputation or status in the eyes of his group. If public opinion had remained adamant, no matter what laws had been enacted, duelling would have still been practised among us.

Why is it that the feelings which accompany the practice of every kind of reprisal or of revenge are painful? Indeed, all the feelings which enter into the practice of the code of enmity—envy, jealousy, emulation, covetousness, and hatred—are unpleasant, while all the feelings which support the code of amity are pleasant and abiding. The explanation I offer is that resentment is unpleasant to make sure that it will be put into execution, so giving relief by gratification. Hume implicitly recognized the pleasantness of the feelings of amity, and the unpleasantness of those of enmity when he wrote: "Gratitude goes out to virtue; revenge to vice."³⁰ Here the pleasant feeling of generosity, a component of the code of amity, is made the counterpart of revenge, a component of the code of enmity. I have sought to prove (p. 62) that the code of enmity is a necessary part of the machinery of evolution. He who feels generous towards his enemy, and more especially if he feels forgiveness towards him, has in reality abandoned the code of enmity and so has given up his place in the turmoil of evolutionary competition. Hence the benign feeling of perfect peace that descends on him.

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ESSAY X

THE SEARCH FOR STATUS AS A FACTOR IN HUMAN EVOLUTION

Synopsis.—Assumptions made regarding desire for status by primitive man. Ambition is a drive for superiority. Desire for status among animals, particularly among Primates. The urge for status is accompanied by resentment, emulation, jealousy, and competition. The use of force as a means of obtaining status. In human societies the search for status has become widened and deepened. Those who aspire to status in primal societies must observe the dual code. The desire for status develops in childhood and in early manhood, and has an inborn basis. The desire for status promotes the welfare of the group as well as the advancement of the individual. Groups, tribes, and nations are extravagant in their claims for status. The search for power. The role of status in bringing about evolutionary changes. Ambition as a factor. The claims for status are tried and sanctioned at the bar of public opinion. Ordination as an organizing factor. With the coming of civilization, individuals were released from group control and were free to compete against each other for status. Man desires a status outside the animal kingdom.

At what stage in his exodus from a simian to a human state man began to give names to living and to dead things, we do not know, but I am to assume that in the primal groups of humanity, whose evolution has been discussed in the preceding essays, each individual of a group had a name, and so had each group. I am also to make the further assumption, on grounds to be brought forward in this essay, that each individual of a group was keenly conscious of the place or status he held in his group, and that each group strove for a high place in the rank of groups. My main purpose is to show that this human urge for betterment in place and in rank, on the part of individuals and of groups, is a chief force in keeping the wheels of evolution

turning; indeed, there is but one stronger force, the urge for life itself.

We may also assume that in the primal world, as in the present, the strength of the desire for status varied from one individual to another, and from group to group; there were areas where the desire was strong, and others where it was weak. We may be certain those groups in which ambitious men abounded were contentious and competitive in their drive for superiority. Here again, then, we find an element of human nature—the desire for status—serving as a factor in human evolution.

A consciousness of status is not confined to human circles; it is found in all social communities of the higher animals, particularly in the order to which man belongs—the Primates. The Scottish philosopher Thomas Reid (1710-96) observed¹ that in “a herd of black cattle there is rank and subordination. When a stranger is introduced to the herd he must fight everyone till his rank is settled. Then he yields to the stronger and assumes authority over the weaker.” My bullocks are continually butting one another to establish their place in the herd. In recent years psychologists have greatly extended our knowledge of the part played by ordination in social groups of all kinds of animals.² In a brood of chicks, superiority is settled by “peck-rights”; some, by their courage, pugnacity, and pertinacity, succeed in establishing an admitted dominance, but in most cases the struggle is renewed with varying fortune from time to time.³ Dr. C. R. Carpenter⁴ studied the behaviour of the American Howler monkeys (*Alouatta*), which were living in a state of nature in their native forest; there were eighteen animals in the group. He observed that each had its rank and place in the group, determined by repeated contest—sex and age being dominant factors. The monkeys of the Old World, especially baboons and macaques, are infinitely more unmannerly and brutal in their fight for status than the gentler monkeys of the New World. The rhesus macaque, for example, seeks to intimidate opponents by means which are “ruthless, cruel, and selfish.” Dr. Carpenter also made the important observation that there was a drive for dominance by one group of rhesus monkeys over other groups, the mastery going to the group with daring male leaders.⁵ Bullying is the method practised by Old-World monkeys to win rank and dominance, but the use of teeth and nails is less

prominent among man's nearest congeners, the great anthropoid apes. Indeed, the orang, the least sociable of the anthropoids, is not interested in status; he is content just to be alive; he seems destitute of ambition.⁶ The chimpanzee, the most social of the great anthropoids, lives in groups made up of fifteen to twenty-five individuals of all ages. "The chimpanzee," writes Dr. Yerkes,⁷ "resents being laughed at, and occasionally takes revenge." His discomfiture is evident if hoaxed by being offered an inflated food-bag instead of a full one; he shows jealousy when preference is given to companions. Professor Hooton⁸ describes the chimpanzee as "a rugged individualist"; he is resentful, jealous, and competitive—qualities which are useful in the search for reputation. The young play at wrestling and fighting, preparatory to the real struggle for rank which is in full swing in groups made up of animals varying from four to six years. In chimpanzee society the male is dominant. In the animals most nearly related to man we find self-consciousness, self-respect, with a desire to be esteemed or valued, in a more or less rudimentary form, whereas we must assume that humanity, even in its pre-human stage, had all these qualities greatly strengthened and, as accessories, a powerful artillery made up of those qualities, such as the spirit of emulation, jealousy, and competition, which vindicate the claims of personal vanity for recognition.

Even among chimpanzees, the most social of anthropoids, rank and reputation are established by the use of physical force. Dr. Yerkes,⁹ after noting that the chimpanzee begins its search for dominance in childhood, sums up his prolonged study of this animal by saying that the demand for "priority of rights is almost the major factor in the life of the mature animal" and constitutes a mode of behaviour which "ensures individual effectiveness." Now, it must be admitted that the simian mode of establishing superiority by the use of physical force still prevails in human societies, both civilized and uncivilized. Schoolboys and grown men still resort to fisticuffs to settle "priority of rights." Personal honour, when duels were in fashion, was vindicated by a resort to lethal weapons. In recent years we have seen minor political parties in Russia, Italy, and Germany establish dominance by a systematic exploitation of the brutal methods of physical force. Independent groups, tribes, and nations still use force, in the form of war, as a means to status.

No doubt, the methods of physical force were employed in primal groups of human society, both to settle individual rank within a group and to establish superiority of one group over another.

In a human society, in comparison with one which is simian, the quest for status has entered an altogether new and extended sphere of influence. This has been brought about, first, by the establishment of a bar of group or public opinion, at which questions of individual status are being judged and noted day by day; conduct is being observed; memory has become armed with words. Secondly, within a human society the "code of enmity," so rampantly practised between the individuals of a simian group, is largely suppressed, its place being taken by the "code of amity." The member of a group who would win the good opinion of his fellows must observe and practise the code of amity. In this way a human society is strengthened both morally and physically. The third important difference between a human and a simian society lies in the fact that the antagonism of one simian society to another is passive rather than active, whereas between human societies the opposite is the case—antagonism, obeying the code of enmity, practises warlike deeds. At the bar of group opinion such warlike deeds are judged as honourable. Hence the ideal member of a primitive human group is the thorough-paced dual-codist—the man who wins a reputation for being a lamb at home and a lion abroad.

Some light is thrown on the origin and nature of the human desire for status if we note its manifestations within a family circle. Every child, born in normal circumstances, has to face the bar of family opinion. In a family there is an ordered series of dominance, beginning with the father and descending to the last born. Only by accepting this order can there be peace within a family, yet most children, from the end of their third year onwards, strive to modify family opinion in favour of their own self-importance, by boasts, feats, lies, deceits, and other modes of extravagant behaviour. Blushing and shyness begin to appear in children before the end of their fourth year;¹⁰ both manifestations are evidence that a sense of self-importance, an instinctive desire for status, is awake within them. Seeing the early age at which blushing and shyness appear and the impossibility of acquiring the power to blush by any form of

voluntary effort, we must conclude that the desire for individual status is instinctive or inborn. But the forms which this instinctive desire will take depend entirely on the culture, customs, and tradition which a child absorbs from its group. Further, the quest for status is closely linked with sexual life, for it is when the young reach sexual maturity that they become super-sensitive of personal appearance and of criticism, and become emulative, envious, jealous, and competitive.

In this essay I am concerned, not with the psychology of status, but with the part which it plays in securing the welfare and survival of individuals and of groups of primitive humanity. In such primitive societies the search for individual recognition is usually attended by advantage to the group as a whole. This was realized by Hume in the following passage :—

“ Self-love is a principle in human nature of such extensive energy, and the interest of each individual is, in general, so closely connected with that of the community, that those philosophers were excusable, who fancied that all our concern for the public might be resolved into a concern for our own happiness and preservation.” ¹¹

In the pursuit of self-interest a man hopes to establish his standing and reputation in his group. His behaviour and his deeds come up for review at the bar of group opinion; if his action relates to the “ home affairs ” of the group and conforms to the code of amity, then it is commended and his status is advanced; if a flagrant breach of that code, then he loses status by being disgraced. If his words or actions relate to the “ foreign affairs ” of the group, then, if they conform to the code of enmity, they are commended and he may be regarded as a hero; if not, then he may find himself treated as a traitor. The co-ordination of a tribesman's care for his own reputation with that of his concern for the name of his tribe is closer and more automatic than has been suggested in the sentences just written.

The tribesman who works to exalt the name and fame of his tribe is rewarded by an advance of his own name and fame. The same bias which makes him exaggerate his own worth, and so gives confidence in himself, leads him to magnify the importance and power of his tribe; pride in self has its counterpart in pride of tribe or patriotism. He is sensitive to criticism of self, and still

more to any reflection cast on his tribe. The bias which causes him to lavish praise on his own tribe when turned on an enemy leads him to pour scorn and contempt on all neighbouring and rival tribes. In these, and in many other ways, the search for status, both for the individual and for the group, was, and is, woven into the texture of tribal life, giving zest and urge to activities of individuals and of groups.

The Australian aborigine is vain and fond of praise;¹² with him, precedence counts for much;¹³ each tribe claims pre-eminence over all the others. Primitive peoples speak of themselves as being "the people"; the Hottentots, for example, call themselves by a name which means "the men of men"¹⁴ or the "real men,"¹⁵ and many similar instances might be cited.¹⁶ The Somalis in Kenya refused to pay taxes unless they were given the status of Asiatics.¹⁷ The children of Israel regarded themselves as "the chosen people"; when their name and fame reached the kings of Canaan "their hearts melted, neither was there spirit in them any more, because of the children of Israel"—an illustration of the power which status can give to a people. The Arabs regard themselves as the noblest nation; all others being barbarians—a self-estimate very similar to that made by the ancient Greeks. A Chinese minister of education exclaimed, "How grand and glorious is the Empire of China, mother of the grandest men in the world."¹⁸ Emerson ascribed "a sense of superiority" to the people of England, a trait in which his own people of the United States are not now lacking. The late Lord Curzon, in 1931, declared that the British Empire was "the greatest instrument for good the world had ever seen," while Joseph Chamberlain held the opinion that "the Anglo-Saxon was to be the predominant race in the history of civilization."¹⁹

A belief in future greatness is said to be a source of strength to a people. A search for power is the devouring desire of nations as well as of individual men; status, as given by power, is now measured by the number of army divisions a people can muster in the day of battle, but in the springtime of man's evolution the power or status of a group was measured by its manhood. When we note the early age at which the quest for status begins in human life, its innate character, its universal prevalence among all living peoples, civilized and uncivilized, can we doubt its presence and its activity among the primal

groups of humanity? The search for power, we may assume, determined the destiny of ancient groups just as it now determines the destiny of nations.

At this present time most philosophers assume that the aim of existence is to permit every child born into the world to develop to the full its inborn qualities amid the circumstances provided by the society into which it is born. We may say the same of human groups; they exist in order to develop their collective qualities as teams amid the circumstances of their time. Now, it has been observed that whenever matters relating to the life or to the welfare of individuals or groups come up for decision human passions are aroused—passions which are felt as being painful. Vital matters refer to the destiny of individuals or of groups, and have therefore an evolutionary significance. The pursuit of status leaves a trail of passion in its wake, as indeed competitions of all kinds are apt to do. Ambition is at the root of man's wish to excel; emulation, jealousy, envy, and covetousness are its attendant furies. "Emulation," wrote Hobbes, "is an endeavour to enforce our ability in competition," while envy is "competition with ill intent." The same author defines ambition as "desire of office or precedent," and notes that it gives rise to the same ill-feeling as covetousness.²⁰ All these qualities were regarded by the Scottish philosopher Reid²¹ as "given by our maker for good ends"; the desire to excel, he regarded as "the god within us." The impulse to compete is strongest in the ambitious, but even in the least ambitious child there is some desire to find a recognized place among its fellows. Seeing how firmly the desire for status is implanted in human nature, and how competitive that nature is, we are justified in ascribing these qualities to primitive humanity, and in saying that in their operation they produced the same kind of results as are seen in modern societies. We may assume that in the ranks of primal groups individuals pursued their quest for reputation and precedence, and that when members of the group met for gossip we may be sure that their favourite topic was a comparison of the merits and demerits of their fellow men and women. In this way was group opinion kept alive, and in such a way were the men and women chosen to guide the destiny of their group. Nor can we doubt that the antagonism and rivalry between the groups of primal humanity were less adamant than those which

prevail between groups or nations in the modern world. Nor should we doubt that inter-group rivalries became so acute from time to time that physical force was used to enforce status, leading to brawls—the incipient forms of war. In such ways, so I assume, the search for status in man's primal world determined the destinies of individuals and of groups.

There is another important service which the search for status renders to groups of primitive humanity; it helps to knit the members of a group into an organized unit. Let me illustrate its manner of working by citing a description which W. H. Hudson gave of the organization of a pack of semi-wild dogs:—

“But from the foremost in strength and power down to the weakest there is a gradation of authority; each one knows just how far he can go, which companion he can bully when in a bad temper or wishing to assert himself, and to which he must humbly yield in his turn.”²²

In a group of human beings, who have to spend their lives as members of the same small society, the search for status leads to the establishment of the relative authority of each individual, and thus knits the society into an organic whole. I do not know of anyone who has made a census of a tribe to discover the distribution of self-assertiveness among its members, but if it were made, I should expect to find a normal curve of distribution—the self-assertives falling to one end of the curve, the “deferentials” or “submissives” to the other end, while the great central area would be filled by those in whom both of these qualities are present in varying degrees. The process of ordination—that is, the search for status—combines these holders of diverse qualities into a workable society.

So far I have been discussing man's desire for status as seen in primitive groups, in which there is no division into class or caste, all being parts of one texture. With the coming of civilization and the detribalization of peoples, individuals became freed from group control, and were thus at liberty to indulge their desire for status to a degree unknown in the primal world. Social conditions in the civilized or post-primal world are well illustrated by the following quotation from the *Wealth of Nations*:—

“The principle which prompts us to save, is the desire of betterment of our condition, a desire which, though calm and

dispassionate, comes with us from the womb and never leaves us until we go into the grave." ²³

This desire for betterment, aided by the accumulation of wealth and the greater freedom of the individual, led to the stratification of modern populations into classes. Man's desires always turn him towards the class above him and away from the class below him. He is pleased when ranked above his claim, upset when placed below it. The castes of India are of the nature of tribalities; like tribes, they struggle for status, treasure it, and are proud of it.

I have said nothing of the dignity of man, nor of family pride, nor of high birth, although all of them have a place in the search for status. No doubt if men were free to choose they would claim descent from beings which were ranked above them. The ancient Greeks gave their heroes a divine paternity. The people of Japan assigned a divine origin to their emperor. If mankind were guided purely by feeling, it would infinitely prefer the Mosaic narrative of man's creation to Darwin's account of his evolution. Many souls shrink when they think of the number of purely animal functions which are at work in their bodies; they seek to forget such things or to hide them. Nor is this aversion to animality merely a prejudice of the civilized mind; a native will reprove his fellow by comparing his manners to those of a beast. I do not seek to explain this widely spread aversion on the part of men to be classed as an animal; my reason for mentioning it now is that I believe it weighs with some anthropologists when they set out to trace man's evolutionary history. They give him a line of descent which frees it from all entanglements with the lines which lead to anthropoid apes and to monkeys.

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HUMAN NATURE AS AN INSTRUMENT OF GOVERNMENT

Synopsis.—Primitive humanity has no apparent government. Animal societies are governed by instinct; groups of primitive humanity are governed by human nature, the elements of which are the progeny of instincts. The final aim of group government. To be governed, a people must first be delimited. A group must be held together by social and other bonds. How human nature serves in the protection of a group. The role of fear. The protective machinery also preserves the independence of a group. The significance of independence. The elements of human nature which secure the reproduction and continuation of a group. The group is a "cradle" for the young and has to be protected. The part played by tradition in the government of a group. Tradition is ultimately a product of human nature. The group as a school for the teaching of tradition and custom to the young. How human nature deals out rewards and punishments and compels observance of its ordinances. The duality of man's mentality, a necessity for group evolution. Group behaviour is regulated by the dual code. The form of behaviour implied by clannishness and party spirit is based on the practice of the dual code.

AFTER visiting the natives of Tierra del Fuego in 1832, Darwin reported that "the different tribes have no government or chief; yet each is surrounded by other hostile tribes."¹ If he had made a journey into the remote past of the primal world and examined groups of early humanity, his report would have been drafted in the same terms; no ostensible means of government were to be observed; no proclaimed law, no magistrates, no policemen, no administrators. Yet we must assume that in the early groups of humanity, just as among the Fuegians, a rough sort of order was maintained within each group, otherwise groups would have fallen to pieces. "Look closely enough," wrote Sir

Edward Tylor, "and you will find rudiments of government in primitive groups."² That is true; the main purpose of this essay is to expound the thesis that a primitive group of humanity is governed by the action and reaction of those inborn mental qualities which are known collectively as "human nature." Nay, my thesis is somewhat more ambitious than I have stated, for I am persuaded that human nature not only supplies the means of group government, but that it has been so evolved as to govern the evolutionary destiny of human groups. What do I mean by "evolutionary destiny"? It is a trite saying that the object of a man's existence is to develop all the potentialities and latent powers that are within him. The student of evolution seeks to explain the existence of a primitive group of humanity in a parallel manner; its chief end is to bring to light the hidden potentialities of its germ-plasm. To do that the group must remain intact and separate, not for one generation, but for an infinity of generations. Human nature is constituted so as to control and regulate the affairs of a group, not only for a generation, but so as to secure its perpetuation over an infinity of generations. In brief, I am to maintain that politics—the art of regulating and controlling the conduct of a community—is part of the machinery of evolution.

Government can be applied only to a community which is sharply delimited from surrounding communities. For purposes of administration modern governments find it necessary to divide their territories into small units, known as parishes, and larger, known as counties. "Tribal law," wrote Bagehot, "could work only on an isolated group."³ In Essays V and VI we have seen how human nature works to maintain group isolation: first, by the individuals of a group being conscious of membership being restricted to their own group; secondly, by limiting their active sympathy to fellow members; thirdly, by an aversion to all who are not members of their group; fourthly, by a deeply rooted prejudice (patriotism) in favour of their own group and of the territory on which it lives. In such ways does human nature work to secure the condition of isolation which makes the self-government of a group possible.

There are certain other conditions which must be complied with to make a group capable of self-government. Its members must be bound together by bonds of mutual affection and of understanding; they must be known to each other; they must

have confidence in each other; they must have those qualities which incline them to mutual service and co-operation. Under the domination of a quest for status (see preceding essay), each member of a group has established a relation with every other member; each has learned how far he may command, and how far he must obey. In assuming that all these conditions were present within the groups of humanity of the primal world, I am fortified by an observation made by Darwin on animal societies while he was still a naturalist on board the *Beagle*. "As we see those animals whose instinct compels them to live in society and obey a chief, are most capable of improvement, so it is with the races of mankind." ⁴ If discipline and obedience had been instituted in animal societies under the sway of instinct, we need not hesitate in believing that under the rule of human nature, which is the progeny of instinct, they were also present in human groups of primal times.

The safety of the people is regarded by all statesmen as the supreme law; everything must be sacrificed to secure that end. How, then, was the supreme law upheld in a primitive tribe? The machinery of protection was supplied by certain elements imbedded in man's mental nature, but before naming these, and specifying their mode of action, it will be advantageous to recall an important principle which we shall now see in action. The principle involved is that which compels a tribesman to sink his individuality in that of his tribe; so strong is this principle that, in certain circumstances, there is a complete surrender of self for the good of the tribe. Take the strongest of man's prepossessions—the instinct for self-preservation; so strong is the principle of transference that a man, to preserve the life of his group or tribe, will overcome his own most powerful instinct—that of self-preservation—and give his life. Mental qualities which serve for the protection of the individual, such as fear, alarm, anxiety, care, concern, and suspicion, are transferred by the individual to the group and are used for the protection and preservation of the group.

Fear is the agent which stirs the other elements of human nature into action. Fear sharpens eyes and ears into vigilance. "One hardly ever finds a New Zealander off his guard, either by night or by day"; so wrote Captain Cook of the Maoris of his time. Fear serves as an alarm for all social animals, but in man, owing

to the high development of his mental qualities, it becomes manifest in a myriad of forms. It may be a mere uneasiness, a suspicion, an anxiety, or it may reach a degree of extreme terror. Fear prepares the way for protection. When danger comes close to the group, alarm passes from mouth to mouth; a feeling of indignation sweeps the group, giving it the comforting feeling of unity of resolution and unity of action. When danger materializes in a threat to the life and integrity of the group, when an injury is inflicted, then the passion of resentment is aroused, a passion which demands reprisal. Anger mobilizes the physical forces of the body and places them at the service of the passion of resentment. Fighting powers, which serve primarily for the defence of the individual, are called forth collectively for the defence of the group. These forces, used for defence and offence, may be under the command of blind, aimless rage, or they may be braced by that strong, resolute, and deliberate form of will known as courage. Such, then, is the manner in which human nature has been organized for group defence. Man is not singular in having his mentality organized for group defence; a corresponding organization is present in all communities of social animals.

Of the dangers which lead to the mental mobilization of a group's defensive powers, there is one of which I have made no mention—namely, a threat to its independence. Now, we say a group is independent when it recognizes no higher authority, but is free to work out its own destiny—that is, its own evolution—under its own government, which, in the case of primitive groups, is the government of the ruling powers resident in human nature. I do not suppose that a primitive group ever made independence the conscious object of its struggle; it fought to maintain its integrity and its separateness from all neighbouring groups, and in so doing secured its independence.

There is a second and very important department of group government which remained, and still remains, almost entirely under the rule of human nature. This is the department which has to do with the reproduction and continuation of the group. A living group is but a link between a dead ancestry and an unborn progeny. It is a government's business to carry out "a partnership, not only between those living, those who are dead, and those who are to be born."⁶ The replacement of the existing

group is secured by the "imperial passion," the impulse which compels young men and women to "fall in love," to mate, to desire children, and to rear them. "Sex-love," as Thomas Reid has remarked,⁷ "has effectually secured these objectives in all ages and in every state of society." The care and upbringing of children has been safeguarded by one of the strongest of inborn emotions—that of maternal love. Maternal care is supplemented by the inborn partiality a father has for his own children. So omnipotent are the parental impulses that they may be said to enslave mothers and fathers for the best part of their lives in the service of their children. Child-rearing may be regarded as the chief industry of every social community; if this industry fails in a group, then that group passes out of existence. The process of evolution permits no balking of the reproductive instincts; the infertile groups are rigorously eliminated, and the fertile perpetuated. The parental duties which prevail among human beings are particularly onerous, owing to the prolonged period during which children must be cared for and fed. Just for that reason human parental impulses have a compelling potency.

A group of primitive humanity may be regarded as a cradle for the young; the cradle is filled by the working of those elements of human nature just specified. The sole duty of group government is to protect the cradle; to this duty a group is always on the alert. Nothing rallies the fighting spirit of a human group with such impetuosity as a threat to its women and children—to its cradle. The duty of protecting the young by a parent or parents is a very ancient ordinance of Nature, but in the human kind this ordinance is carried out by the whole parental group. The cradle is also safeguarded by group opinion, which regards every act that legitimately fills the cradle as good, and therefore a virtue, while every form of conduct which tends to make the cradle empty as bad, and therefore a vice. There is, too, in human nature a desire for perpetuation of name, of family, and of group—an accessory aid to reproduction. In all these ways human nature presides over the reproduction and continuation of a human community.

So far I have been discussing the part taken by the various elements of human nature in governing the affairs of a group of primitive humanity. I am now to turn to the problem of how, within each primitive group, experience became treasured, handed

on from generation to generation as an oral tradition, and how this tradition became accepted by the group as an embodiment of its law. I have at this moment a herd of ten bullocks, which, although they met in my fields as strangers, have in the course of a few months organized themselves into a self-governing community. Their organization is entirely the result of the interaction of their inborn mentalities; no ancestral herd taught them how to behave, nor will they 'in turn' hand on their experience to the herd which will succeed them. It was quite otherwise with groups of early humanity; each group was reared under the tuition of an ancestral group; and each in turn handed on its beliefs, its rules of conduct, and its experience to the succeeding generation. I am making the assumption that the primitive men and women with whom I am dealing had reached that point of cerebral development which made it possible for them to make their feelings, their needs, their loves and hates known to each other by means of articulate sounds. Further, I am assuming that the memories of these early men and women had become sufficiently strengthened to serve, not only as treasuries of their own experience, but also to carry all kinds of lore gleaned from the generation in which these men and women grew up. Amid that lore were the proper modes of conduct, habits, customs, and the right attitude to be assumed towards all the forces of Nature by which the group was surrounded; in brief, each group was the carrier of a tradition. But it was more than a mere carrier of tradition; it was a school in which that tradition was taught. Round the family hearth, children drank greedily of the words of wisdom that fell from the lips of parents and of elders. Falling on the receptive mentality of childhood, these words gave the deep impression of being final truths or convictions that had to be remembered and obeyed. Thus the young of every generation grew up with a formulated code of beliefs and convictions which was to regulate their conduct as members of their group.

"Custom is king, nay tyrant, in primitive society," declared the late R. R. Marrett.⁸ Sir A. M. Carr-Saunders also is of opinion that tradition governs the thought and conduct of a group; ⁹ if this be so the behaviour of a group is regulated, not by human nature, but by tradition. With this I am prepared to agree, but with this proviso—namely, that tradition itself is codified human nature. Tradition is experience gained under the

workings of human nature; unless tradition is consonant with human nature—perhaps I ought to have written group nature—it is powerless to regulate conduct. Thus, in an ultimate sense, primitive groups of humanity were, and are, ruled by human nature.

Up to this point I have been discussing the legislative function of human nature; I now turn to the mode in which human nature enforces its policy and its enactments. Among the Trobriand Islanders, Malinowski¹⁰ observed that conduct was regulated and law enforced by public opinion; a desire for status, love of praise, and fear of blame compelled the islanders to fulfil their contracts and to observe custom. Malinowski's islanders were scarcely primitive folk: they had gardens or plantations; they reaped the harvest of the sea; they exchanged goods by barter; whereas the primitive groups which I have in mind lived on what they could gather or on what they could kill within their nature-clad territories. "The savage," wrote Dr. Marett, "cannot stand up for a moment against an adverse public opinion; so that to rob him of his good name is to take away all that makes life worth living."¹¹ How is public or group opinion formed? There is nothing so greedily and constantly noted by primitive men and women as the conduct of their neighbours; wherever two or three are met together, the behaviour of the absent is appraised. A tribesman does desire to stand well with his fellows; he dreads their ill opinion. "What is customary is obligatory; a breach of custom calls forth the indignation"¹² of the group. I do not mean to suggest that primitive man was a paragon of virtue, or that his conscience was so sensitive that he could not bear to do wrong; he would not have been human had he not at times risked the gratification of an illegitimate desire if he had a chance to escape the punishment of group condemnation. Nevertheless, group opinion, with its system of rewards and punishments, served to keep order in a primitive community under ordinary circumstances. Major breaches of group law, such as murder or adultery, called forth "retributive moral emotions"¹³ of such intensity that the group, assuming the black cap, as it were, inflicted on the criminal its severest penalty, that of ostracism. This, in reality, was a capital sentence, for the man cast out by his group was doomed. In such ways, then, does human nature assume the role of judge, and by

enforcing the verdicts of public opinion maintains order in a group, and so serves as an instrument of government.

I have left to the end of this essay the discussion of what I consider to be the most important aspect of human nature as a governing force. I have already noted (Essay VII) that human nature has a dual constitution; it is made up of two parcels of qualities, of two codes. So far as I have gone in this essay, only one code has been discussed—the code which rules in all the “home affairs” of a group, the code of amity. The code which dominates in all “foreign affairs” of the group—the code of enmity—has not been mentioned.

Let me first give a brief enumeration of the chief elements in human nature which go to the working of the code of amity. They are love, affection, sympathy, fellow-feeling, mutual trust, faith, goodwill, mutual service, tolerance, charity, and loyalty. In the enmity or cosmic code are included the qualities which are the converse of those just enumerated—namely, dislike, hate, ill-will, distrust, suspicion, intolerance, deceit, treachery, contempt, envy, jealousy, and malice. The tribal mind is so constituted that no contradiction is felt in the use of two opposite codes of conduct, one towards friends, the other towards enemies; nay, a failure to observe the dual code would be one of the gravest breaches of group custom. The use of the dual code involves the observance of two standards of justice, one standard valid for home affairs, the other for foreign affairs.

How are we to explain the duality of uncorrupted human nature? I know of only one satisfying explanation. If we assume, as we have good reasons for doing, that human evolution has been effected by group contending or competing with group, then we can realize the advantage of a mentality which worked in the interests of a “home group” and against those of neighbouring groups. Such is my case for affirming that human nature has been developed, not only as an instrument of government, but also as an instrument of evolution.

Readers may well suspect that my conviction of the truth of the evolutionary process has biased the interpretation I am giving of human nature. I shall therefore cite in my support the evidence of a philosopher who thought and wrote long before Darwin was born. Here is what Hume had to say of human nature:—¹⁴

"It is acknowledged . . . that human nature remains still the same in its principles and operations. . . . Ambition, avarice, self-love, vanity, friendship, generosity, public spirit; these passions, mixed in various degrees, and distributed through society, have been, from the beginning of the world, and still are, the source of all actions and enterprises which have been observed among mankind. . . . Should a traveller give an account of men who were entirely divested of avarice, ambition or revenge; who knew no pleasure but friendship, generosity and public spirit, we should immediately detect the falsehood and prove him a liar with the same certitude as if he had stuffed his narration with centaurs and dragons."

Therein Hume recognizes the duality of man's mental nature and that those elements which the civilized mind counts as evil are just as essential to its constitution as those qualities which are regarded as good or virtuous. Hume, however, had no explanation to offer of this duality; that became apparent only when the light of evolution fell on it.

It is not usually recognized that the practice of the dual code gives rise to that form of behaviour known as "clannishness" or "party spirit." Clannishness is the application of the code of amity to one's friends, and of the code of enmity to one's enemies. This truth has been recognized by Professor F. H. Hankins in the following statement:—

"In relation to one's own gang, whether tribe, political party, or business group, one must be loyal, honest, truthful and steadfast, charitable and helpful. In relation to the 'out-group' one becomes meritorious in proportion as one is deceitful, treacherous, lying, vacillating, cruel and destructive."¹

In this passage Professor Hankins is not concerned with what human nature ought to be, but only with what it has been and still is. He also recognizes that the "spirit of clannishness is both a consequence of, and an aid in, the group struggle for existence."

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LEADERSHIP AND LOYALTY AS FACTORS IN HUMAN EVOLUTION

Synopsis.—Leadership introduced a new principle into group government. Evidence which favours the opinion that chieftainship appeared at a very early date in the government of human groups. The first requisite for leadership is that the members of a group must be born unequal in their mental outfit. There must be a just proportion of those qualified to lead to those qualified to follow. Qualities of human nature which fit a man for leadership. The qualities needed in followers. Loyalty and allegiance defined and their mode of action explained. The need for mutual confidence between followers. Leadership and loyalty give strength to a group, and have therefore an evolutionary significance. Conscience; what it is; its value as a factor in social evolution. Repentance and conversion as group phenomena. Proselytism as a factor in group life. Its conversion into missionary zeal. The dual action of conscience.

IN the preceding essay I have pictured the primal groups of humanity as democracies living under the sway of "human nature," final decisions resting with the more elderly fathers of the group. This picture is based on what we know of the tribal government among Australian aborigines, but even among them we find a tendency for one man to be given, or to assume, more power than his fellows in settling the affairs of the group, a new principle of government being thus introduced—that of dictatorship or despotism. In Central Australia, Spencer and Gillen noted that there were tribes in which "men not so old, but more learned in ancient lore or more skilled in matters of magic, were looked up to by other members of the tribe, and it was they that settled everything."¹ To this I may add the testimony of Sir E. B. Tylor: "It is common," he wrote, "to find amongst rude tribes such a headman or chief chosen as the most important

or shrewdest . . . who gets his way by persuasion or public opinion."² He adds that "government by grandfathers breaks down in wartime." Darwin was of opinion that a primitive tribe gained an evolutionary advantage by adopting the principle of chieftainship. "The perfect equality among the individuals composing the Fuegian tribes," he wrote, "must for a long time retard their civilization. . . . The inhabitants of Otoheite, who, when first discovered, were governed by hereditary kings, had arrived at a far higher grade than another branch of the same people—the New Zealanders, who were republicans in the most absolute sense."³ One may hesitate to describe the Maori form of tribal government as republican, but there can be no doubt as to the great power wielded by their tribal chiefs. Writing of Melanesia, Keane has this: "Chiefs exist everywhere, being endowed with religious sanctity in Fiji, where they are regarded as the direct descendants of the tribal ancestors."⁴ Rivers⁵ found "leadership at its highest in the Solomons and Fiji," and that the best-led tribes had the strongest hold on life. We may infer, then, that the primal groups of humanity which adopted the principle of leadership had an advantage over those which did not.

Darwin inclined to the belief that even in the earliest human groups government was of the leadership type, otherwise he would not have expressed the view that: "as man is a social animal, it is almost certain he would inherit a tendency to be faithful to his comrades and obedient to the leader of his tribe, for these qualities are common to most social animals."⁶ Darwin's opinion is supported by what we know of the group behaviour of the Primates most akin to man. Dr. Bingham,⁷ who studied gorillas in their native habitat, found evidence among them of leadership and discipline, the male gorilla acting as protector of his group. Chimpanzees, which are milder and more variable in temperament than gorillas,⁸ have their group affairs managed by several males rather than by one dominant animal. Every troupe of baboons has its leader or leaders;⁹ so has every troupe of macaques. Dr. C. R. Carpenter had an opportunity of studying macaque societies living at freedom on a small island,¹⁰ and found that when a certain leader was withdrawn from his troupe, the troupe became less enterprising and its range of territory less extensive. Thus we may

presume that the principle of leadership had been evolved in simian societies prior to the date of man's appearance.

There is another reason for suspecting that dominance by a leader must have been, if not the original form of group government, yet of early date. Is not every conceivable form of family rule a government by dominance? Did not most children born within an ancient group come under male dominance during the opening, impressionable years of life? If the mother remained in the home of her family, her children came under the rule of their maternal uncle; if she moved to her husband's home, then they came under the control of the father. The mental qualities which make family life possible are the basal elements of human nature. In the eyes of children the chief male of a family occupies an exalted status; he is submitted to and obeyed with feelings of which love and fear are ingredients. When a youth's sense of family membership expanded into a sense of group membership he was already prepared to obey a form of group leadership. For this reason, and also because of the evolution of leadership among mammals much lower in the scale than man, I am prepared to believe that the office of chief may have been instituted in the very oldest human societies.

I now pass to the consideration of the conditions which must exist in a group to make possible its organization and its government under a chief. The first condition is that men must be born unequal in their mental outfit. While all must be endowed with the same elements of human nature, yet in each individual these elements must be combined in a different proportion. In some there must be a strong competitive desire for position or status, an ambition to lead, to command, to have power. In the majority there must be a lesser development of the "competitive complex," a development which inclines them to accept the place which falls to them in the group rather than to seek for a higher one; content to submit, to obey, to follow, if by so doing they can come by security and ease. "Providence," said Lord Kames, "sends both leaders and followers."¹¹ This was also the belief of Sir Francis Galton: it was he who realized that for the welfare of a flock, of a herd, or of a human community, leader and followers must be born in the right proportion.¹² Freud bears witness to the truth of this opinion as follows: "That men are divided into leaders and led is but another manifestation of

their inborn and irremediable inequality." ¹³ Another psychologist, Carveth Read, also held the same belief: "A pack or tribe needed enough variability to produce able leaders and enough average ability to follow and support them." ¹⁴ We must count Hobbes among the dissentients. He framed his ninth law of Nature thus: "That every man acknowledge other for his equal by Nature," and adds, "The breach of this precept is Pride." ¹⁵ Nature breaks the ninth law of Hobbes every time a child is born. Thus we reach the conclusion that for a human community to be easily governed, whether under council of elders, or under a youthful dictator, there must be a just distribution of various elements of human nature among its members. A community made up of ambitious individualists will break up because of internal discord, while one composed of self-denying, unenterprising diffidents will fall a victim to its aggressive neighbours.

What were the mental gifts which qualified a man to become a leader of his group in the primal world of mankind? I assume that they were just the same gifts as make men leaders in the modern world. Let us take some modern instance—that of Josef Stalin, who has made his way from a humble home in the Caucasus to the proud leadership of the United Soviets of Russia. Qualities which have been ascribed to him are: "Had aims and ambitions which he kept to himself but pursued them relentlessly; had plans which he revealed only when he had discovered the wishes of those around him; infinite energy for work; a genius for the management of men." ¹⁶ In brief, Stalin had ambition, self-reliance, and an intuitive knowledge of human nature. Let us now take an instance from leadership in the Church. Lord Lang, who had been Archbishop of Canterbury, lamented the death of his successor, Archbishop Temple, in these words: "He had the essentials of leadership—courage, conviction, and confidence." ¹⁷ In my opinion, convictions are of great importance; they give the mind a safe anchorage. We now turn to a modern military leader, Lord Wavell, for a confirmation: "No amount of study or learning will make a man a leader unless he has the natural qualities of one; he must have character which is a knowledge of what he wants, and courage and determination to get it." ¹⁸ Here emphasis is placed on qualities of the will, for courage and determination express the degree of command:

man has over his actions. If I were asked: "Which of all these qualities is the most essential for a leader to possess?" my reply would be: "An intuitive knowledge of human nature." In this I have the support of the philosopher Hobbes, who wrote: "He that is to govern a whole nation must read, not this or that particular man, but mankind."¹⁹ This was also the opinion of Edmund Burke, who held that the first requisite in a statesman is "to know how to manage human nature."²⁰ Thus I come back to my thesis—namely, that human nature constituted the machinery of government of early groups of mankind, whether rule was centred in a single leader or in a council of elders.

The qualities just reviewed are those of modern leaders; no mention has been made of other qualities which must have been of prime importance in primitive communities. The man who faced dangers with a stout heart and a strong right arm, who defended the group from attacks by man or beast, must have occupied the highest place in public esteem. We may be sure, too, that members of a group responded to the man who, while slaking his thirst for place and fame, worked for the welfare of his group. We may also hazard the opinion that in those early times there were men who carried themselves so that they had only to knock to have the door of leadership thrown open to them, while others had to break down the door by force before they attained their ambition.

I am seeking to build up a picture of the mentality which kept groups of ancient humanity alive and assured their continuance. I have reviewed the qualities which went to the making of leaders; I must now turn to the qualities which go to the making of followers. The most reliable source of information at our disposal is that to be found in family life. Which are the elements in human nature that make children cling to their mother's skirts and dog her footsteps? There is, in the first place, a positive force—the mutual bond of affection or love; in the second place, there is a negative element—that of fear, fear of being separated from the security which the mother's presence gives. We get nearer to the relation of led to leader if we consider the mental attitude which a boy adopts towards his father. Here, too, fear and love are combined, but fear in this case arises not from an apprehension of separation, but from a realization of the power which lies behind a father's command. The father imposes obedi-

ence and discipline; his power gives him the means of bringing the recalcitrant under his rule. Between a father and his children there grows up a particular emotional relationship, one which makes his children into his devoted followers. In the eyes of children the father becomes no ordinary man; feelings—prejudices—arise within them which magnify him above all other fathers; he becomes their lawgiver, their pride, and their boast; they regard him with respect, esteem, admiration, even reverence. With this training in the family circle, the youthful tribesman, when he passes into the public life of his group, has already in him the seeds of allegiance to his group and of loyalty to his leader.

Let us consider loyalty first. I use it as a term to designate the feeling which exists between a follower and his leader. This feeling is a mixture of admiration and devotion on the part of the follower, who submits his will to that of the leader, and resolves to follow wherever he may be lead. Loyalty implies more than mere submission; when accompanied by the fervour of enthusiasm, as it often is, it means a complete surrender of self. Admiration may pass into worship, and worship can encircle the head of the leader with the halo of divinity.

Allegiance is of the same mental quality as loyalty—with this difference. It is based on a man's consciousness of being a member of his group, and carries with it a sense of duty towards his group. With the coming of leadership, be it in the form of a chief, of a totem, or of a god, the obligation of allegiance passed into the more intense feeling or emotion we name loyalty. Allegiance was defined by David Hume as "an obligation of obedience" and loyalty as "the feeling towards a ruler."²¹

We have been discussing the mental bonds which link followers to a leader; just as important are those which serve to unite one follower with another. The chief bond between tribesmen is that known as mutual confidence or mutual trust—a bond which permits a man to rely on his fellows for instant co-operation and support in all circumstances. Confidence is of the nature of a conviction—that is, a belief which, being reinforced by an inborn mental predisposition, gives the mind the certainty that a final truth has been reached. To the good tribesman faith or confidence comes in two forms. He must have confidence in himself; he must be self-reliant; he must have faith or confidence in

his fellows. The feeling on which the conviction of trust is based is that of brotherhood; there must be brotherly affection between men before the bond of trust can arise between them. According to Thucydides "the most fierce are the most trusty."²²

Darwin recognized that the group in which leadership and loyalty were strongly developed had an advantage in the contest with other groups. He inferred that a tribe which "included a great number of courageous, sympathetic, and faithful members" would be a victor over one less fortunately situated.²³ Bagehot²⁴ was of opinion that a "tribe is maintained by loyalty, fealty, authority, bigotry, and observance of custom." Winwood Reade's judgment on clan loyalty merits special consideration because it was based on personal observation of tribal life:—

"This feeling of fidelity to the clan . . . was based in their hearts; it was a true instinct inherited from animal and ancient days; it was with them an idea of duty, obedience to which was prompted by an impulse, neglect of which was punished by remorse. . . . They have no conscience outside their clan. . . . Within their own communion they live according to the golden rule and would be destroyed by their enemies if they did not."²⁵

Thus, in emphasizing the importance of leadership and loyalty as factors in human evolution, I can claim the support of high authority.

What part did conscience play in the group life of early men? I shall try to answer this question by considering the relationship of conscience to loyalty. Loyalty I have defined as an exalted feeling which places the will of a follower at the disposal of a leader. In the passage just cited from Winwood Reade, fidelity or loyalty is described as a "true instinct"; if this were really so the loyal follower would have no choice; uncompromising instinct would secure instant obedience. The better opinion is that, with the expansion of the human brain, all the original social instincts became unloosened and converted into mental propensities or inclinations, so that man could obey them or refuse to obey. Let us suppose that the follower, at the moment when a command from his chief tells him to repair to a certain rendezvous, is engaged on a task of private interest; nevertheless, yielding to his feeling of loyalty, he answers the call, and is rewarded by the

gratification of this feeling or sense of duty. But suppose the tribesman yields to his private interest and denies his leader; then his feeling or sense of loyalty is left unsatisfied, and he is punished by being stricken with discomfort or even pain. That feeling of discomfort which follows failure to obey a social impulse is conscience. A tribesman's duties to himself may be safely left in his own hands, but those social duties he owes to his leader and to his fellows, when the bonds of instinct were unloosened, had to be safeguarded and reinforced in the manner just described—by the action of conscience. A tribesman has to satisfy much more than his social impulses; in his childhood he drinks in the oral traditions of his group, its customs, its beliefs, its taboos, and its attitude towards the natural and supernatural. The learning so acquired sinks into the childish mind as final truths, as convictions. Now convictions have the force of instincts; they are safeguarded by conscience; to disobey them gives rise to a painful uneasiness. There could have been no order or government of a primitive human group unless conscience had been at work within it. A group of conscienceless men and women could not endure for even a day. Conscience, then, is part of the evolutionary machinery of social government.

There is one mental state which I have found difficult to fit into my scheme of group evolution—namely, that of individual conversion. Let us take the case of St. Peter. In denying his Lord, he did his sense of loyalty so grave injury that he was left in the state of extreme regret known as repentance. Repentance gives rise to an intensely submissive state of feeling known as conversion. Now conversion implies a complete yielding up of self to the will of a leader, with a resolve never again to harbour a rebellious thought, but to obey him implicitly for ever afterwards. In ancient groups of humanity there must have been men and women who failed in their social duties and suffered from the pangs of conscience. How could they be restored to the ranks of the faithful unless breach of conscience was followed by repentance and conversion? It is in such a way I would seek to fit the phenomena of repentance and conversion into a scheme of evolution.

Besides conscience there is another constituent of human nature which at first sight seems to lie outside any scheme of group evolution—namely, the desire or urge which we find in many men

to convert others to their way of thinking—in brief, to proselytize. To get unity of action in a primitive group, there must be unity of conviction. We can understand the utility of aggressive proselytizers in a primitive community; their efforts would work towards unity of opinion and of action in their own group. But how are we to explain the annual exodus of thousands of enthusiasts from civilized communities, prepared to sacrifice comfort and life in order that the heathen may be saved? The evolution of missionary zeal I seek to explain in the following manner. We have seen (p. 71) that man's social consciousness has an expanding tendency; consciousness of membership of family spreads until it becomes group conscious. With the union of groups to form tribes, and of tribes to form nations, consciousness of membership expands until tribe and nation are embraced. It is but a step farther for all mankind to be included within a common brotherhood. As consciousness of membership expanded, so did the urge to proselytize. It is in this way I seek to explain the evolution of missionary zeal.

There is one important aspect of conscience of which I have made no mention—namely, its duality. Human nature has a dual constitution; to hate as well as to love are parts of it; conscience may enforce hate as a duty just as it may enforce the duty of love. For example, conscience has a twofold role in a soldier: it is his duty to save and protect his own people and equally his duty to destroy their enemies. Let us take an example from group life. A tribesman has been injured or slighted by a companion; if he seeks to satisfy his feeling of resentment by retaliating in kind, he will find the opinion of his group is against him. He therefore seeks to slake his resentment by a return to a state of amity, a return which is made easy if by the repentance of the offender. But suppose the offender is of another group or tribe; then the duty of revenge becomes imperative. Conscience, reinforced by group opinion, will give no rest until the duty of revenge is accomplished. Thus conscience serves both codes of group behaviour; it gives sanction to the practices of the code of enmity as well as to that of amity. It must have been this twofold action of conscience which made Hume exclaim: "The heart of man is made to reconcile contradictions." 28

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ESSAY XIII

MORALITY AS A FACTOR IN HUMAN EVOLUTION

Synopsis.—Statements by Darwin concerning evolution and morality. The importance of group evolution. Under morality the author includes, not only the rules which regulate the conduct of individuals, but also those which regulate the behaviour of groups. Man's dual code of morals. Instinctive control in animals became control by human nature in man. Man's morality is controlled by the elements included under the term "human nature." Human nature and therefore morality has been the subject of the eight preceding essays. If human nature has been evolved, it may still undergo change. The plasticity of human nature is discussed, and the conclusion reached is that it is among the more stable parts of man's fabric. Human nature versus tradition as a factor in moulding morality. Is a sense of justice or "fair play" acquired, or is it inborn? Man has by nature a dual code of justice; without such duality group evolution could not take place. Individual and collective responsibility in primitive societies. With all its evils, group selection has certain great merits.

WHEN *The Descent of Man* appeared in 1871, it was reviewed by John Morley (later, Viscount Morley), who found fault with certain of its statements relating to the origin of man's moral behaviour. He was rewarded by a letter from Darwin¹ in which the following passage occurred: "I have endeavoured to show how the struggle for existence between tribe and tribe depends on an advance in the moral and intellectual qualities of the members and not merely on their capacity for obtaining food." A second letter ended with this sentence: "Undoubtedly the great principle of acting for the good of all the members of the same community, and therefore of the species, would still have sovereign sway."² Side by side with these two statements, let me set one taken from the text of *The Descent of Man*: "We have seen that actions are regarded by primeval man, as good or

bad, solely as they obviously affect the welfare of the tribe—not that of the species, nor that of an individual member of the tribe.”³

From these statements we learn that Darwin was of opinion that each group or tribe of primitive humanity had its own rules of social conduct; that the group which had good rules was more likely to survive than the group which had bad rules; if the rules adopted made for the welfare of the group, then they were good or virtuous; if they had an opposite effect, then they were bad or vicious. It must be obvious to my readers that these statements have a direct bearing on the problems which are being discussed in these essays. I have given my reasons for assuming that early manhood was separated into an immense number of small, independent, local groups, and that the ascent from a simian to a human state was made, not by the competition of one individual against another, but by the competition (and selection) of one human group against neighbouring human groups. Clearly, the group in which the men, women, and children behave towards one another so that there is unity of heart and singleness of purpose will outlast the group in which mutual conduct is such as to give rise to internal strife and a discordancy of aim.

So far I am a follower of Darwin, but now I come to a point where I depart from him. He restricted morality, as most philosophers still do, to the rules which regulate the behaviour of men and women living together within a single group or community, whereas I include within the bounds of morality not only conduct within a group, but the behaviour of one group towards other groups. There is an intra-group morality, and there is an inter-group morality, and of the two the latter is the more important from an evolutionary point of view. It is for this reason that I have insisted again and again in the preceding essays on the duality of man's mental nature; man is not only dual in his nature, he is also dual in his morality. His conduct within his group was regulated by one set or code of morals, while he adopted an opposite code in his behaviour towards “outside” groups. Perhaps it may be said that his “home” conduct was moral while his “outside” conduct was immoral. But we know that savage tribes look upon both these forms of conduct as moral, or right, and we may assume that early man shared in this belief.⁴

All are agreed that the behaviour of social animals is regulated by instinct, and most students of human evolution are of opinion that those inborn mental qualities or predispositions which powerfully incline men towards one line of belief and action, and turn them away from another—qualities known collectively as human nature—are the progeny or representatives of the instincts which guided man's simian ancestors. Human nature, then, having taken the place of instincts, should also take over their function—the regulation of conduct—and we find that this is so. Social animals have within their natures a Mount Sinai which issues commandments as they are required; human nature issues, not commands, but requests, and these are of varying degrees of urgency. Some are imperative, such as, "Thou shalt preserve thy life"; "Thou shalt mate"; "Thou shalt not treat thy friends as thou dost thine enemies." Here I am not speaking of ethics, which is concerned with what man's behaviour "ought" to be, but of morals, which treat of what man's conduct is and has been. Sir Leslie Stephen defined ethics as "the Science of Human Nature";⁵ it is morality rather than ethics which deserves this definition.

In seeking to base man's morality on his inborn mental nature, I have the support of many authorities. I am with Lecky when he wrote: "I shall defend those who believe that our moral feelings are an essential part of our constitution," and am still with him when he added "developed by education."⁶ I am with Huxley when he penned this sentence: "In whichever way we look on the matter, morality is based on feeling, not on reason."⁷ I have the support of Edward Carpenter: "The theatre of morality is in the passions; virtuous and vicious passions are eternally distinct."⁸ McDougall is with me: "Liking and dislikings are the bases of morality."⁹ Although the Scottish philosopher Thomas Reid was of opinion that human nature had been "created," while I believe it to have been "evolved," yet we are of the same opinion as regards its relationship to morality. "For that which makes men capable of living in society is that their actions are regulated by the common principles of human nature."¹⁰ Reid has also my wholehearted support in the following paragraph: "There is no active principle which God hath implanted in our nature that is vicious in itself, or that ought to be eradicated, even if it were in our power. They are useful

and necessary in our present state.”¹¹ If I can show that “instinct” and impulse determine the conduct of human beings massed in modern societies, then there is all the more reason for presuming that the behaviour of prehistoric man was also so regulated. Sumner of Yale declared that: “The great mass of any society lives a purely instinctive life.”¹² Viscount Morley held a similar opinion. “For the common mass of men,” he wrote, “use and wont, rude or gracious symbols, blind custom, prejudices, superstitions, are the only safeguards of the common virtues.” ■

So far I have said nothing about an important matter which concerns human nature. If it has been evolved and is still subject to evolution, then it may change, and with that change there must be a modification in man's behaviour and morality. To solve this problem I shall call as my chief witness Dr. R. A. Fisher.¹⁴ “Hereditary proclivities,” he affirms, “form the basis for man's fitness for social life.” Hereditary proclivities I take to be another name for human nature. More to the point is another of his statements: “Differences in behaviour, whether due to conscious behaviour or to impulsive reaction, do in fact determine differences in the rates of death and reproduction. And behaviour is determined by the constitution of the mind.” Parents in whom the emotion of sympathy is strongly developed are more likely to bring their children to maturity than parents who are deficient in this emotion; children of sympathetic parents are more likely to be sympathetic than those born of unsympathetic parents. Bagehot gave the same idea a different expression. “Those children,” he wrote, “that gratified their father and mother most would be most tenderly treated by them, and so have the best chance to live.”¹⁵ Thus the group in which sympathetic parents abounded should, other things being equal, outlive other groups in which parents were less solicitous and sympathetic. In the group struggle, affections are powerful weapons. McDougall perceived the relationship of morality to group survival when he affirmed that “the principal condition for the evolution of moral nature lay in group selection among primitive societies constantly at war with each other.”¹⁶

In these essays, from the fifth onwards, I have been dealing with human nature as manifested by groups of primitive humanity, but until the present essay I have not mentioned morality. If I am

right in maintaining that human nature provides the basis of moral behaviour, then I have really been discussing morality all the while. In Essay V, for example, we found that primitive man limited his sympathy to his own group; that necessarily determined his actions towards those who were members of his group and those who were not members. In Essay VI we found that a man's zeal for his native group and for his native land made his behaviour that of a patriot. In Essay VII man's co-operative and competitive propensities were seen at work. In Essay VIII evidence was brought forward to show how far man's common actions were controlled by bias and prejudice. In Essay IX we saw how powerfully human conduct is influenced by the feelings of resentment and revenge. In Essay X we surveyed man as the slave of status, noting him controlling his conduct so as to win the approbation of his fellows, their respect, esteem, and love. In Essay XI an endeavour was made to estimate the extent to which man's everyday actions are influenced by his nature, while in the essay which precedes this (XII), the behaviour needed to make successful leaders and faithful followers was discussed, and we concluded with a brief dissertation on conscience to serve as a prelude to the present essay on morality. The fundamental fact that underlies all manifestations of human nature is its dual basis. It is based on two potent passions—those of love and of hate. What a man loves he will strive to preserve; what he hates he will strive to destroy. It is so now, and we may presume it was also so in man's primal period.

If it be the case that the mentality of primitive man was radically different from that of modern man, as is maintained by some authorities,¹⁷ then what I have said of human nature would not be applicable to "grouped" humanity of the earliest times. Or if it be true that human nature is plastic and can be "altered out of all recognition," then modern mentality would be no guide to ancient mentality. These two problems, which are in reality but one, must be answered before I proceed farther in my argument. From my portfolios I could bring a cloud of witnesses in support of the plasticity theory of human nature, and only a few who are convinced of its stability. None the less I share the conviction of the minority. Let me illustrate the basis of my conviction by the use of a simile. Ancient man had a taste in foods which he satisfied as best he could by the gatherings from

Nature's table; modern man satiates his desire for food in a thousand ways his remote ancestors knew nothing of. The appetite remains the same; the change has been in the variety of ways it may be satisfied. Or take another basal desire of men—to stand well with their fellow men so as to earn distinction. The opportunities of early man lay within the narrow circle of his group; he could satisfy his ambition only by rendering it some important service; whereas modern man may seek to satisfy his ambition in thousands of ways. The basal desire remains the same; it is the modes of satisfying it that have changed. The modern lover may embroider his courtship with many a new frill, but his passion is that which moved the first of human lovers.

In the preceding eight essays I have enumerated the passions, feelings, predispositions, and desires which I attribute to early man, and have been at some pains to make plain the grounds on which I have made these attributions. I have attributed to early man the same elements of human nature as are still to be found in modern man. Without doubt, selection has been at work on human nature during past æons, strengthening some of its elements and weakening others, but my conviction is that human nature is the least plastic of the qualities which go to make up the fabric of the living human body. So long as man continues to be an intensely social animal, this is likely to remain as before.

To strengthen my case I will cite the evidence of a few expert witnesses. First, this from Sir Henry Maine:¹⁸ "The stable part of our mental, moral, and physical constitution is the largest part of it." Second, from Sir Leslie Stephen:¹⁹ "The great forces which govern human conduct are the same as they always have been and always will . . . a dread of hunger, thirst, cold; a love of wife, child, and friend. Sympathy with neighbours and a resentment of injuries." Third, the answer which Charles Duff has given to the question, "Does human nature change?" His answer is: "The superficial manners of men have changed considerably, but those fundamental instincts and emotions upon which human nature is based have undergone little real change."²⁰

I am now to turn to the consideration of a subject which, at first sight, seems to favour the idea that human nature can be quickly and radically changed—namely, that of tradition. Each group of primitive humanity has its own tradition, which is handed on by word of mouth from generation to generation.

Tradition represents the accumulated experience and wisdom of a group, and is made up of several items, such as usages, customs, habits, manners, morals, and beliefs concerning events, both natural and supernatural. Such is the impressibility of the young child's mind that the teachings of tradition, as practised by parents or elders, sink home as convictions—as final truths which have to be treasured, obeyed, and, in due course, again handed on. Now, suppose a white child has been kidnapped and adopted by a native tribe of black men. The child will absorb the "black" tradition, its sense of right and wrong, its customs, and its attitude to surrounding groups.²¹ Certainly the child has been given a new morality. But it has not been given a new human nature. It is just because the white child has the same human nature as the black that it has been able to absorb and obey the black child's code. It was the white child's moral food that was changed, not its moral appetite.

Marais²² observed that baboons which had been reared in captivity starved when set free in a locality where wild animals of the same species prospered. This observation seems to imply that wild animals teach their young the art of living and that tradition has a place in monkey communities. John Hunter, the master surgeon of the eighteenth century, has recorded instances of young animals being taught by their dams.²³ Tradition, however, became potent in the living world only when the human brain had attained that degree of development which made speech possible. The brains of human beings who lived early in the Pleistocene period, say half a million years ago, have a conformation which suggests an aptitude for speech, if not its reality. The early groups of humanity, postulated in these essays, I suppose to have lived at this remote period. I have assumed that these early men were already capable of approving and of disapproving, of showing their feelings, of making their wants known, and of putting their simpler thoughts into articulate sounds. In short, I am assuming that at this early period human nature and experience were being codified in the form of tradition. The group with a tradition which inculcated "the rearing of the greatest number of individuals in full vigour and health, with all their faculties perfect"²⁴ should have been in a stronger position than the group with a more timid tradition. Carr-Saunders is of the opinion that in the struggle for survival

tradition is more potent than inborn mental qualities. "A good tradition," he remarks, "has a winning quality."²⁵ Tradition is important, but I cannot conceive a people nursing and handing down a tradition that is not, or has not been, conformable to their inborn mental qualities. The early Israelites had a distinctive tradition which was inculcated with a religious zeal;²⁶ an equally zealous observance has carried their children successfully through two thousand years of dire vicissitudes.

The student of human evolution turns with especial interest to that part of tradition in which a group hands down its conception and its rules of justice. The most striking fact he meets with is that every known primitive group transmits two codes of justice, one code for use at home, the other for use abroad. "For that cannot be lawful," said Aristotle, "which is done not only justly, but unjustly also." Nevertheless he was well aware that Barbarians applied one rule of justice to their friends and quite another to their enemies, and in both cases deemed they had behaved justly. Socrates, asking a definition of justice from his compatriots, received two answers: "Justice is doing good to friends and evil to enemies"; "Justice is nothing else than that which is advantageous to the stronger."²⁷ Both answers were true, not only of the forms of justice practised in Ancient Greece, but are true of every ancient society known to us, and indeed are still true of the justice which exists between nations. Plato was in search of a single principle of justice which would serve the needs of all men at all times, but here we are concerned with only two smaller matters. When did this dual form of justice come into the world? and, why did it come?

We have already seen (Essays V, VII) that in all communities of social animals there is one rule of conduct towards members of a community and another rule for those which are not members. A dual code of justice was in existence long before man came into existence, but in his hands each code became greatly strengthened and the separation between them became more complete. And if it be asked why this most inhumane development took place, the answer is to be found in the mode of human evolution. The mode of human ascent was by means of group selection; the more a group based its code of justice for home use on love and amity, and the more sternly it applied an opposite code to opposing groups, the stronger it became in the evolutionary

field. A dual code of justice finds its justification in its evolutionary utility. Bagehot makes the following cryptic remark: "Savages play the game of life with no knowledge of its rules,"²⁸ which can be interpreted only by those who have as intimate a knowledge of human evolution as he had. The "rules" he refers to are the laws of evolution; the savage is their unconscious slave; he adopted a dual code of justice in utter ignorance of its serving any evolutionary purpose.

Moralists are agreed that no human society, ancient or modern, can hold together unless its members observe amiable rules of justice. Has man, then, an inborn sense of justice? Hume was of opinion that justice was an acquired virtue, learned and practised because of its utility.²⁹ I think that it is more in keeping with the evidence at our disposal to say that man is born with a strong disposition to be just to members of his own group and unjust to those who are not of that group. If we agree that man's inborn feeling of resentment is his reaction to an injustice, and that his inborn display of gratitude is evidence of a consciousness of having been treated with more than justice, then we must admit that he is born with a disposition towards justice. The inborn nature of conscience is also in favour of this view. Children manifest a desire for fair play at an early age. On the other hand, it may be urged that a child's sense of justice may be determined entirely by the tradition it inherits. In the tribal life inherited customs are obligatory (Westermarck). A child absorbs the code or codes of justice taught by its group; but is not its capacity to absorb due to its inborn disposition? Tradition determines only the food on which its disposition feeds.

There is another aspect of justice as practised by groups of primitive humanity that requires mention because of its evolutionary significance. Within a group each individual was held responsible for his words and for his actions. If a man's action rose above a group's standard of justice, it was received with the praise of his fellows; he was rewarded by being advanced in esteem and in status; thus was a desire for status yoked to the chariot of justice. If his behaviour fell below the accepted custom, then he sank in the esteem of his fellows and was punished by a loss of status. If his deeds were of a kind which we now regard as capital crimes, then his group outlawed him, and that, in early times, was equivalent to a death sentence. Individual responsi-

bility held within the group, but in all actions which lay outside the group another principle of justice was imposed—that of collective responsibility. A group was held responsible for every injury which one or more of its members might inflict on neighbouring groups. Such responsibility had a twofold effect: it served to diminish inter-group disturbance and crime, and it also knit members of a group more closely together, thus giving that desirable group quality—solidarity.

My readers may think, after what I have written about the duality of group justice, that the evolutionary method of group selection was altogether evil. This was far from being the case; the system had several outstanding merits. Let me quote a passage which Darwin wrote while discussing the origin of man's "instinct of sympathy": "Nor could we check our sympathy even at the urging of hard reason, without deterioration in the noblest part of our nature."³⁰ We are beholden to group selection for that "noblest part of our nature." A group was a nursery of sympathy; the affections which bound parents to children and children to one another flowed out from the narrow circle of the family to pervade the wider bounds of the group. The group was a school of mutual aid; it could carry not only its complement of fighting men but had room for those who could interpret life and embellish it. It had room for the weak and those in need of sympathy. Early man, like modern man, could be kind, and also he could be fierce.

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ESSAY XIV

THE MACHINERY OF EVOLUTION

Synopsis.—In this essay the author enters another field of inquiry—the means by which evolution is effected. The methods applied to the solution of evolutionary problems have greatly changed in the author's lifetime. The influence of Mendel, Galton, Pearson, and Morgan. The author assembles an isolated group of Sinanthropes on which to illustrate his evolutionary creed. A high death-rate and a compensatory high birth-rate are postulated. The student of evolution views human beings as carriers of reproductive genes. We are linked to our simian ancestry by a continuous trail of gene-containing germ-plasm. The author is a Weismannist. The process of evolution in the motor-car world compared with that in the world of humanity. The machinery of evolution is made up of three factors: those of production, competition, and selection. The triple process as seen in the car industry and in human communities. The manner in which new types are brought into existence. Artisans compared to genes. Pearson's "new theory." Trends explained in terms of genes. The "trend process" is applied to explain the increase of the human brain. Mutation of genes has played only a minor part in the evolution of human races. The process of evolution compared to that of legislation.

It may be well if I notify my readers that in this essay I enter another field of inquiry. In Essays I-IV I gave my evidence for believing that early man was divided into small isolated groups, each of which occupied a delimited territory; in Essays V-XIII I dealt with the mental qualities which keep members of a group together and also which turn them away from members of adjacent groups. In this essay I am to begin an inquiry into the means by which the men and women of a group change in the characters of their bodies and minds if they continue to inbreed over a long period of time. I shall speak of the means and circumstances which bring about such changes as "the machinery

of evolution." The mere choice of such a term as "machinery" will reveal to the reader what I would willingly have withheld from him—namely, that I am mechanically minded; I can reach results only when I can form concrete images of the means involved. Now, an inquiry into the process of evolutionary change requires an aptitude for, and a training in, mathematics, neither of which I possess. Nevertheless I have not been blind these past fifty years to the results obtained by those gifted individuals who have applied statistical methods to the solution of evolutionary problems. I have seen the statistical methods devised by Sir Francis Galton (1822-1911) developed into a powerful mathematical instrument by Karl Pearson (1857-1936)—an instrument which is undergoing still greater refinements in the hands of modern students of heredity. I have seen grow up, bit by bit, the evidence which leaves us in no doubt that the basis of heredity within each germ or reproductive cell has a particulate form, each particle or gene being exceedingly minute in size, with living potentialities which control the development and growth of the human body. The demonstration by means of the higher powers of the microscope that the hereditary material of the germ cell has a particulate form was a triumphant vindication of the rightness of Mendel's theory—namely, that heredity is particulate in the manner of its operation. Thus the credo I am to apply to the interpretation of man's mode of evolution has been built up as I went along, its Darwinian basis being modified by the teaching of Mendel, Galton, Pearson, T. H. Morgan, and of many others.¹ I know, too, that my credo has but a passing value; as our knowledge of human evolution widens and deepens it will be replaced by one more in accordance with ultimate truth.

In order that we may have a concrete example in front of us, I propose to empanel a group of early humanity, such as existed in China near the beginning of the Pleistocene period: people who lived, according to the most reliable estimate, about 600,000 years ago. It so happened that at this remote date a series of limestone caves became filled in, entombing fragments of the people (now known as *Sinanthropes*) who then lived in that part of China. They were people who retained certain marks of the ape—namely, prominent eyebrow ridges, receding foreheads, and low-roofed skulls. Fragments of thirty-eight individuals

were unearthed;² of these, it is important to note, fifteen were under fourteen years of age, and only one was over fifty years; the remainder were between fourteen and fifty. Such figures suggest a heavy bill of mortality. That early man was shorter lived than modern man is also suggested by observations made by Professor Vallois. He brought together the data bearing on the age at death of the Neanderthals—people who belong to a later date than the Sinanthropes—and found that forty per cent of them had died under eleven years and only five per cent were over forty.³ I am therefore to assume that in my group of Sinanthropes numbering one hundred individuals the expectation of life was low—not more than twenty years. For convenience of calculation let us infer that our group is made up of individuals at all ages, half of them being males and half females. I make the further assumption that for the bare maintenance of the group we must assign a territory of two hundred square miles, for taking one season with another and one year with another we must allow about two square miles per head for primitive man. I am also making the assumption that our group of Sinanthropes was antagonistic to surrounding groups and maintained its separation from them, as indeed is always the case with a truly primitive human group.

Let us assume that death claimed ten members of our group every year, the chief mortality being in infancy, and that this loss was annually made good by ten births. To see how such a result might be attained we must note the age distribution in the fifty individuals—infants, girls, and women—who made up the female side of the group. Let us divide them into three age classes: (1) those under fifteen years, the number in this class being fifteen; (2) those between fifteen and thirty-five (the years of fertility), for I assume that in primal times women were fertile for only twenty years of their lives. This class I suppose to have kept up an average number of twenty mothers who, one year with another, had to supply ten new lives to make good the loss by death; (3) women who had passed the thirty-five-year mark, numbering fifteen individuals. My scheme involves that each year a maid of the pre-fertile class reaches her fifteenth year and so passes into the maternal class, and that one mother reaches the age of thirty-six and so enters the post-fertile category. Thus every twenty years the mother class is renewed; in the

course of a century it is replaced five times. During that period this class, breeding at the rate of ten per annum, has provided the group of Sinanthropes with a thousand new lives to replace the thousand which death has taken from it. With such a turnover of lives, selective agencies are given many opportunities of effecting changes in the constitution of the group. In modern civilized communities it is estimated that sixty per cent of people are the victims of selective agencies, that an eighth part of one generation gives birth to half the succeeding generation,⁴ that in the course of a century fifty per cent of families are eliminated and replaced by expanding families.⁵ If these things are true of modern societies, we may assume they were equally true of ancient societies. The group which occupied the Sinanthrope territory at the end of a century would thus have differed in many points, both in body and in mind, from the group which held the same territory at the beginning of the century.

So far I have written as if my sole interest had been in the survival of the individual men and women who made up our Sinanthropic group of early humanity. In reality, as a student of evolution my chief concern is not in the survival of the individual men and women, but in the survival of the germinal units or genes contained and carried within the reproductive glands of these men and women. The evolutionist is materially minded; the Sinanthrope who failed to put his genes into circulation within the group and so remained childless is regarded by him as a mere cypher in the chain of descent. The number of genes in circulation within our Sinanthropic group must have been truly enormous; it has been estimated⁶ that within the cell which is to give rise to a new human being there are some 25,000 determinants or genes. Our interest, for the moment, is not in the vast population of genes within our Sinanthropic group, but in the relationship between the genes and the living bodies in which they were contained. At a very early stage in the development of a human embryo a parcel of the original gene-containing germ-plasm is laid aside to be handed on in due time to another generation. And so it has been and will be. The genes from which our Sinanthropes arose were the direct descendants of those which at a much earlier period in the earth's history gave rise to ape-like forms. And these same genes which shaped the bodies and minds of Sinanthropes are very probably the ancestors of the genes which

circulate in the bodies of the modern inhabitants of China.⁷ Thus I have placed my readers in possession of a fundamental part of my anthropological credo—namely, that genes change and evolve, and that evolutionary events in the upper world are determined by what happens in the underworld of genes.

Another part of my credo is my belief in Weismannism.⁸ Genes are in the body; they are living and are nourished by the juices of the body, and yet their life is unaffected by that of the body. Nothing a man can think, feel, or do will alter for either good or bad the powers and potentialities of his genes; the habits and the skill he has acquired at the cost of continuous effort leave them untouched. If we could believe with Lamarck and with Darwin that genes can be, and are, influenced by what the body does, how easy would be the solution of many of our evolutionary problems! For example, the lines appear in the palm of the foetal hand just where the skin is to fold when the hand is clenched. If we believe that the effects of use can be inherited, then we can give a satisfying explanation of the early appearance of suitable lines in the foetal palm. Yet this simple explanation is rejected by the vast majority of students of heredity; indeed, in my immediate circle there is only one eminent anthropologist—Professor Wood-Jones⁹—who regards the many adaptations of the human body as a result of the inheritance of use and wont.

How, then, do those who believe in the independency of genes explain the ascent of humanity from a simian ancestry and the many wonderful adaptations which characterize the human body? It so happens that during the half-century I have been inquiring into the evolution of the human body I have seen the motor-car or automobile pass from the crude image of a horse-drawn vehicle to the finished products which crowd our modern roads. It will help the reader to understand what I mean by "the machinery of evolution" if I turn aside for a moment and compare the process of evolution as seen in the car world with that which I believe to take place in the world of mankind. In both cases we have a triple process at work—namely, production, competition, and selection. In the car world the buying public serves as the selective agency; it buys according to its needs, its taste, and the state of its purse. The firm which fails to cater for these needs and fancies soon ceases to exist. Com-

petition arises because there are many rival firms which cater for the same public. We now turn to the group of *Sinanthropes* and ask: "Where is the selective agency? And how does competition arise?" The selective agency in this case is power, and by power I mean every quality that contributes to the strength and survival of a human group. A group to survive must have amity and unity at home and a will to resist attack from without. I have assumed, in our group of *Sinanthropes*, that births merely equalled the number of deaths; but let us assume, as we may well do, that births exceeded deaths, not only in our group, but also in surrounding groups, and that numbers had come to exceed what the natural produce of their territories could sustain. Then there must ensue a struggle, a competition, between our *Sinanthropes* and neighbouring groups, for territory, for sustenance, for life. In this struggle it may happen that our group has proved so powerful that it succeeds in exterminating a neighbouring group, and so is in a position to plant its superfluous numbers as a new colony or group in the conquered territory. The area of our *Sinanthrope* genes will thus have been extended. Such, then, is what I conceive to have been the chief mode of competition and selection in the primal human world.

I shall now attempt a more difficult feat of comparison—that of contrasting the production or reproduction of a car with that of the development of a human child. Our comparison must explain not only how old types are reproduced, but how types are introduced, changed, improved, and evolved. To compare with our *Sinanthropic* group, let us choose a large factory, one divided into some ten departments, each department producing a variety of the same type of car. In the car world production takes place under one roof, while competition and selection are fought out in the open, whereas in the human group all three processes take place, as it were, under the same roof. We have already glanced at the genes of production in the human world, but where are we to find them within our car factory? The genes within the factory are the myriads of skilled artisans and labourers we observe within each of the ten workrooms of our factory. The car artisan differs from the human gene in two important respects: the artisan works outside his material, whereas the gene works within its material, both gene and material being alive. The other important difference is that the artisan has to acquire his

skill, whereas the gene, like the worker bee, comes into life with its skill fully developed. To strengthen our comparison let us assume that the artisan, like the worker bee, performs his day's work instinctively and fashions a particular pinion quite unconscious of the end it is to serve. We have to assume, too, that our artisans are divided into teams, each team being engaged on the production of a single car. By the continued co-operation of a team a finished car is made ready for the road. We make a similar assumption in the production of a child; we have reason for believing that within the fertilized human egg there is assembled a vast team of ultra-microscopic genes which co-operate in the production, first, of an embryo, then of a foetus, and finally of a fully developed babe.

So far as my comparison has gone it has illustrated merely the reproduction of former types; it has thrown no light on how types are changed and improved. Now, in modern factories there are designing brains receiving intelligence of defects in their firm's cars and hints as to what the public is in want of. From such information the designers set to work and, not only remedy the defects, but modify the type so as to make it a more efficient instrument. In the factory which I have just postulated the artisans work purely by instinct; they are deaf to intelligence; they cannot be affected by experience; they can only go on producing their accustomed type. But let us suppose that new teams can be formed, that we can combine half of the artisans engaged on a larger size of car with their opposite numbers derived from a team engaged on a smaller size of the same type of car. Then if we set this new combination of artisans to work, the car which emerges will differ from former products in size and many other details. Such is the method which is actually employed in the genetic scheme of production. In the fertilized human ovum the team of genes has a dual origin: half is derived from the father and half from the mother; each fertile mating thus brings a new combination of genes into being. Each maternal gene seeks out its corresponding paternal gene; human genes are thus duplicate structures. If, then, we are to complete my comparison, we must arrange the artisans of our new team in pairs, each artisan from the larger car being linked with the corresponding workman taken from the smaller car. We must also assume that our artisans, even those who perform

the same allotted task, differ in the zest, energy, and even skill with which they set to work; like a gene, our artisan may be energetic and dominant, or may go about his work indifferently, or may be so little skilled as to be counted a mere labourer. Genes of this nature are known in the human world as recessives. Now, two dominant artisans, if they come together, will form a forceful partnership; a dominant artisan, if yoked with one of the labouring grade, will cover the defects of his partner; but if it should so happen that two of the labouring grade become linked, then there will be a piece of defective workmanship which will soon be made apparent when the car takes the road. We may regard our artisans, as we do the germinal genes, as dominant, neutral, and recessive; we may combine them in an almost infinite number of new teams; yet so long as they retain their original inborn natures, they will go on producing mere varieties of the old type; they will fail to produce a new type of car. In the group of *Sinanthropes* it was assumed that, in the course of a century, a thousand matings had taken place and a thousand new combinations of genes thus brought into existence, and that at the end of a century the group was regarded as differing only in detail from the ancestral group. The mode of radical change to bring about the evolution of a new type has still to be exemplified.

To introduce what may be named the "effective machinery of evolution," let me cite a paper which Professor Karl Pearson published in 1930 and to which he gave the title "*On a New Theory of Progressive Evolution*."¹⁰ He was then seventy-two years of age, and throughout the greater part of his life had accepted Galton's dictum that in the course of generations exceptional individuals tended to revert or regress towards the mean or average individual of their race. In this new theory Pearson threw Galton's dictum overboard. In 1905 he had commenced the inbreeding of the progeny of a single pair—a dog and a bitch; by 1930 he had reared over 500 specimens of this inbred race and was surprised to find, as he went on, that, far from his breed becoming stable, certain new characters became more and more emphasized. In his new theory he asserts that "if you start with a parentage, however little in excess of type . . . and inbreed, the type, so far from being stable, will progressively alter, without any selection whatsoever." To illustrate his theory he imagines an inbreeding human community

containing a number of tall individuals, and proves mathematically that in a group so constituted there is a tendency or trend to an ever rising average of stature in the group.¹¹ To give a genetic explanation of the Pearsonian theory we must assume that, in the course of matings within a small group, genes with a power to increase stature frequently become linked with genes possessing similar potencies, and that ultimately tall genes prevail within the group. There is in this case a "trend" to increase of stature, and if stature determined the success of a group in the struggle against other groups, there is no reason why the trend should not go on indefinitely. Selection, however, has favoured groups having a medium stature, not those made up of tall, lanky men.

Were it necessary I could cite a large number of evolutionists,¹² who have examined the evidence relating to trends and are convinced that, so far as the production of new forms of life is concerned, a gradual rise in power of a combination of genes is the fundamental factor in the process of evolution. If trend bearers answer the purposes of life, then they are favoured by selection; if they do not, then they are repressed and ultimately eliminated.

To illustrate this thesis as applied to the human species, I again return to my group of *Sinanthropes*. About the stature of this early form of humanity we have little to guide us, but something can be said of the size of their brains. Weidenreich¹³ was able to measure the cranial capacity or brain volume of five *Sinanthropes*; in these five the brain volume varied from 915 cubic centimetres, which is smaller than any brain to be found in most modern races, up to 1,225 cubic centimetres, an amount which places its owner on a lower rung of the modern brain-ladder. We are justified in assuming that within our *Sinanthrope* group there were several families which carried genes tending towards the 1,200 mark or beyond it, and that in the course of matings teams of uprising genes came together, and so helped on the upward trend of brain volume. I am assuming that the well-brained group will be more successful both at home and abroad than groups which are less well equipped.

When we state the rise of the human brain in terms of cubic centimetres, we over-simplify a problem of the utmost complexity. When we remember that in each cubic centimetre of brain matter there may be 20 millions of nerve units, that in a 100 c.c. there are 2,000 millions—which sum represents the total

human population of the globe—and that in a modern brain of moderate dimensions (1,400 c.c.) there are some 28,000 million nerve units,²⁴ then we begin to realize the marvellous organizing powers we are attributing to the genes which regulate the development of the human brain. Yet we cannot get away from the fact that the vast population of nerve cells which make up the brain are the progeny of a single cell—the fertilized ovum—and that the original regulating power was also contained within that cell. In the course of development, detachments of the vast army of nerve cells take up allotted stations, form intercommunications, and so the brain becomes an instrument that commands the body and manages its affairs in life. Yet the problem is not insuperable. Give a commander-in-chief sufficient power and he might succeed in organizing the total manhood of the earth into a single army. To accomplish such a task it must be possible for him to delegate his authority downwards and downwards until it reached all parts of his organizing command. I am assuming that the genes which control the development of the human brain have similar powers of delegation.

There is one manner in which changes can be introduced into the development and growth of the human body which I have not mentioned. A gene may mutate—that is, it may suddenly become changed in nature—and so give rise to an irregular development of that part of the body or brain with which it is concerned. No doubt geneticists are right when they attribute most of the malformation and defects of the human body to gene mutation, yet I am of opinion that gene mutation has played only a minor part in shaping the modern races of mankind.

Thus it will be seen that I place the productive or creative part of the machinery of evolution in the underworld of genes, while I bring the competitive and selective agencies into the upper world of life where men and women are tested, singly as well as in teams or groups. The machinery, as I conceive it, has resemblances to the powers possessed by the Lower and Upper Houses of our British Parliament. The prerogative of initiating and creating new legislative measures rests with the Lower House, the House of Commons; the House of Lords can but select, accept, or reject what is submitted to it by the Lower House; measures have to pass both Houses before they receive the Royal signature and thus become the law of the land. Dar-

win placed what he regarded as the supreme power of evolution—that which he named “Natural Selection”—in the Upper House, whereas we of a later generation, in the light of increased knowledge, place the supreme power—that of creation—in the Lower House.

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ISOLATION AND INBREEDING AS FACTORS IN HUMAN EVOLUTION

Synopsis.—Darwin ultimately was of opinion that evolution was possible without isolation. His reason for coming to this conclusion. The importance he attached to "conditions" also varied. In the post-Darwinian period Romanes sought to establish isolation as an essential factor in evolution. This is also the author's opinion. Romanes's theory of physiological isolation. His theory of psychological isolation, which is quite different from that formulated by the author. The Descent of Man as a source book. The discovery of genes gave a new significance to isolation. Sewall Wright's opinion of isolation as a factor. Isolation implies inbreeding. Selection of mates is a form of isolation. Some results of inbreeding. The effects of isolation as seen in insular populations. Primal groups were separate by language, custom, tradition, and many other circumstances. Inbreeding lessens the range of variability. The results of inbreeding depend on the nature of the genes concerned. In the Pleistocene period human evolution proceeded at a relatively rapid pace. The author's group theory makes this possible. Social communities of all kinds of vertebrate animals are kept apart by psychological isolation.

IN 1868, eight years after the publication of the *Origin of Species*, Darwin received from Moritz Wagner a brochure¹ which sought to prove that geographical isolation or segregation is the chief means by which a new variety or species is brought into existence. My readers already know that it was the peculiarities of the fauna and flora which had become isolated in the Galapagos Islands that first set Darwin thinking about the transmutation of species. He informed Hooker in 1844 that he was of opinion that "isolation is the chief concomitant or cause of the appearance of new forms";² but later he changed his mind when he observed that the richest sources of new species were to be found on wide con-

tinental areas where there were no geographical barriers; hence isolation fell from the high place he had given to it originally. After thanking Wagner for the new facts which he had laid before him, Darwin went on: "But I must still believe that in many large areas all the individuals of the same species have been slowly modified, in the same manner, for instance, as the English racehorses have been improved, that is by the continual selection of the fleetest individuals, without separation."³ It does not seem to have occurred to Darwin that although English studs were not "geographically isolated," yet in a very strict sense our racehorses do constitute a separated or isolated community. Even in the instance he had cited he had not escaped from his dilemma; the moment a breeder begins to select sires and dams for his herd he is bringing into practice a form of isolation.

How, then, did Darwin explain the origin of numerous varieties of the same species on a wide tract of unbroken country? Let me give his explanation in his own words: "In North America, in going from north to south, or from east to west, it is clear that the changed conditions of life have modified the organisms in the different regions, so that they now form distinct races or even species."⁴ Here Darwin attributes to locality a power of producing new varieties without the aid of isolation. He is even more explicit as to the importance of the action of conditions in a passage which is taken from *The Descent of Man*: "The races of mankind have been similarly produced . . . the modifications being either the direct result of exposure to different conditions, or the indirect result of some form of selection."⁵ The truth is that Darwin's mind wavered much as to the importance which was to be attached both to "isolation" and to "conditions or environment" as factors in evolution. Three years before the *Origin of Species* was published he told Hooker that "the conclusion I have come to is that external conditions do by themselves very little,"⁶ whereas later, as we have just seen, he attached to them a role of the highest importance. It is his earlier opinion that I, in common with most students of evolution, now accept as true. The food which a people eat, its richness in vitamins and mineral salts, the climate and mode of life, certainly influence the health and growth of their bodies, but leave their germ-plasm untouched. If we plant an English colony in the heart of Africa, so long as it retains its isolation it will breed true to type, except in one respect.

The tropical climate will favour those strains in the colony which best answer to the new conditions. Conditions, as Darwin usually acknowledged, serve as factors in evolution only when they act as selective agencies. Or we may reverse the experiment and plant a colony of Negroes in a land of white men. If the black genes are kept from mixing with the white, our Africans will breed true to type. Although I hold that external conditions or environment are effective in changing type only in so far as they act as selective agencies, yet I have to admit that the evidence gathered by Boas⁷ leaves little doubt that "new conditions" can directly and immediately lead to an increase of stature and a change of head form.

I have just quoted from a letter which Darwin wrote to his friend Hooker in 1856; I return to that letter because it contains a statement which fits in with my own way of thinking. In answer to certain propositions Hooker had pressed on him he replied: "I cannot agree with your proposition that time, altered conditions and altered associates are convertible terms. I look at the first (time) and the last (altered associates) as far more important: time being important only so far as giving scope to selection." This statement, interpreted in terms of human evolution, I take to mean that, so far as primitive man is concerned, the chief "external conditions" were represented by his fellow men, with men of his own group with whom he lived in amity, and with men of other groups with whom he lived in a state of enmity. As Karl Pearson said in 1904: "It is the stock itself which forms the home environment."⁸

Darwin died in 1882; fifteen years later there appeared a work on isolation,⁹ by G. J. Romanes (1848-94). Romanes was a convinced isolationist; "without isolation," he declared, "or the prevention of intercrossing, organic evolution is in no case possible,"¹⁰ a declaration which, so far as it concerns human evolution, I accept without reserve. As regards the mode in which geographical isolation furthers the process of evolution, Romanes accepted the explanation which had been given by the Rev. T. Gulick and others—namely, that if part of a species is cut off by a geographical barrier, the colony so cut off will carry characters which are either above or below the average characters of the parent species.¹¹ In the course of generations the colony so cut off will diverge either in the direction of its excess or

of its deficiency. "The very essence of the principle being that, when divergence of type has once begun, the divergence must *ipso facto* proceed at an ever-accelerating pace,"¹² a close anticipation of the Pearsonian theory of 1930 (see Essay XIV, p. 132).

So much for geographical isolation; but what of those numerous cases where a species extending widely over an unbroken tract of country has become divided into a series of local varieties? To meet such cases Romanes invented a new theory to which he gave the name of "physiological isolation"; this, in reality, was a theory of infertility. He assumed that along the lines which separated one local variety from another there had arisen a partial infertility which, as it increased, came gradually to isolate neighbouring varieties. Romanes's theory had no foundation in observed fact. Modern biologists are agreed that infertility is not a cause, but a consequence, of the separation or isolation of a species into local varieties.

Romanes mentions also another mode of isolation, to which he gave the name "psychological selection."¹³ He defines this mode of selection (which is also one of isolation) as "the tendency of the members of a variety to breed with one another." The following quotation from the *Origin of Species* proves that Darwin also recognized this form of isolation: "I can bring forwards a considerable body of facts showing that within the same area, two varieties of the same animal may long remain distinct, from haunting different stations, from breeding at slightly different seasons, or from the individuals of each variety preferring to pair together."¹⁴ He also knew that among horses and fallow deer, when free to do so, there was a tendency for the males to seek out females of the same colour.¹⁵ Galton also recognized that "varieties are separated by mating preferences."¹⁶ In Essay V I have already touched upon the tendency of like to seek out like in mating, but so far as concerns human evolution this form of selection or isolation has played but a minor role.

Now, I am of opinion that isolation is an essential factor in the process of evolution. For these thirty years I have been gathering information from all parts of the earth inhabited by primitive humanity, and everywhere I have found it separated into communities or tribes which are resolute in their determination to remain separate and independent. Why they remain apart I have sought to explain in the preceding essays. My explanation of

theory is of a mental or psychological nature, but it is altogether different from that enunciated by Romanes. My explanation of isolation is based on the fact that human nature is dual both in its constitution and in its mode of action. Human nature acts so as to keep the members of a group or tribe together and at the same time apart from other groups or tribes. Human nature is so constituted as spontaneously to attain two opposite codes of behaviour—one, the code of amity, to serve within the group, the other the code of enmity, to serve outside the group. Thus I assume that human groups are isolated from one another by the unceasing action of inborn mental qualities. Another part of my evolutionary *credo* is that human nature has grown up, or been evolved, in the service of evolution.

When I set out to test the truth of my theory that mental isolation has been, and is, a factor in human evolution, it was in *The Descent of Man* that I found most of the corroborative evidence, particularly in Chapters III, IV, and V, which, in reality, deal with the evolution of human nature. Darwin knew that primitive humanity was divided into isolated groups, that members of such groups were sympathetic to one another and were unsympathetic to members of other groups, and that in the evolutionary struggle, group competed against group.¹⁶ Yet nowhere does he suggest that the separation of mankind into groups has an evolutionary significance, nor does he on any page attribute group isolation as being due to a peculiar action of human nature. Such omissions can be understood when we turn to a letter which Darwin addressed to August Weismann in 1872, fully a year after the publication of *The Descent of Man*.¹⁷ Darwin had just received and read Weismann's treatise *The Influence of Isolation on Species-formation*.¹⁸ "I have now read your essay with very great interest," wrote Darwin. "Your view of local races through amixie (inbreeding) is altogether new to me." This is a statement quite unexpected from one who had always insisted that "no breed could be produced if free intercrossing is permitted." A later statement also surprises us. In a letter written in 1878 to another German Professor¹⁹ we find Darwin saying, "Nor do I see at all more clearly . . . how and why it is that a long isolated form should almost always become slightly modified." From these statements we learn that when Darwin wrote *The Descent of Man* he did not regard isolation and

inbreeding as important factors in the production of human races, and therefore failed to realize that the separation of early mankind into isolated groups had a high evolutionary significance.

With the establishment of Mendelianism and the discovery that the characters of one generation are transmitted to the next by means of discrete living particles known as genes, the reason for isolation being an important factor in evolution became more apparent. Let us look on a group of primitive humanity as the bearers of an assemblage of genes; that assemblage is cut off from all surrounding assemblages; no strange genes are allowed into the group. With repeated matings the genes which circulate within the group enter into new combinations and give rise to individuals in which old characters are combined in new ways. As we have already seen (p. 133), trends appear in such groups; there is a tendency for certain of the characters to become exaggerated in a definite direction; genes may mutate or change and give rise to new characters within the group. How, then, do such isolated groups behave in an evolutionary sense? Here is Professor Sewall Wright's opinion:²⁰ "If a given species is isolated into breeding colonies in such a way that there is but little emigration between them . . . in the course of time the species will become divided into local races." Professor Allee²¹ agrees with Professor Wright, and so does Dr. R. A. Fisher.²² In the opinion of Dr. Fisher "partially isolated local races of small size . . . favour progressive evolution and the formation of new species by fission." With the latter's statement Dr. Huxley is in agreement, his opinion being expressed thus: "The smaller the size of a natural population and the more perfectly it is isolated, the more likely is 'drift' to proceed to its limit, resulting either in the complete loss of a mutation from the group, or in its fixation in all the individuals of the group."²³ Thus we may say that isolation now occupies an assured and important place in the "machinery of evolution." It is a condition, not a cause, of evolution. The assemblage of genes within an isolated group of humanity is given an opportunity of developing quickly and effectively all its latent potentialities.

Isolation and inbreeding are, in reality, convertible terms, for if a human group is effectively isolated it must inbreed. It will assist my readers to realize how quickly inbreeding may bring about structural changes if I cite a few illustrative instances. De

Vries crossed two clover plants each of which had a few four-lobed leaves, and by inbreeding produced plants with five-lobed leaves. Guinea-pigs have normally four toes on their front feet, and three on their hind. My friend, Professor C. R. Stockard,²⁴ mated animals with rudiments of a fourth toe on their hind feet and ultimately succeeded in producing a race with four toes on both feet, and believed if he had gone on that he could have produced a five-toed race. Dahlberg²⁵ relates that Graham Bell, by inbreeding the progeny of ewes with extra teats, succeeded in producing animals with six teats in place of the normal two.

Populations inhabiting small and remote islands provide opportunities of estimating the effects of isolation and inbreeding. The evidence which is at hand on this matter would require a volume for its adequate treatment, not the short paragraph I am to give it. "Smaller islands," says Julian Huxley, "give quicker changes than large adjacent islands."²⁶ The islands of the Mediterranean provide many instances of the changes which follow isolation. Keane, in describing the inhabitants of Sardinia, uses these terms: "The Sards would almost seem to be cast in one mould. . . . They have the shortest stature, the brownest hair, the longest heads and the swarthiest complexion of all Italian populations."²⁷ Many of the populations of the smaller islands of the Mediterranean are characterized by peculiarities of their head forms and blood-groupings. A dominant gene, or combination of genes, such as determine form of head or group of blood, once introduced into an island population may, in the course of repeated matings, infect the whole population, thus transforming a long-headed people into a short-headed one.²⁸ Dr. Hansen reported thus on the natives of the Faroes: "The fiords and valleys of the islands facilitated the formation of small communities, differing in mental capacity as in bodily form. Such communities could not fail, when removed to small distant islands, to develop into distinct local types."²⁹ The ancient inhabitants of the Canary Islands were differentiated into island tribes.³⁰ It is not too much to say that each of the smaller islands in the wide Pacific Ocean has a population which is peculiar to itself. I shall content myself with citing only one instance. Sir William Flower when reporting on a collection of skulls, representing a single tribe of an island of the Fiji group, remarked, "Nothing could be more striking than their wonderful

similarity." It was even greater than he had observed among the skulls of Andaman Islanders.³¹

Populations may be isolated in many more ways than those I have mentioned. "A savage tribe," observed Malthus (1766-1834), "surrounded by enemies, or a civilized, populous nation hemmed in by others, is in the same position as islanders."³² National groups and tribes are isolated by their differing forms of speech. The inhabitants of the Andaman Islands were divided into nine tribes, each having its own dialect. In primal times the speech of offshoots of an expanding tribe became, in the course of a few centuries, differentiated into dialects. In six centuries the English of Chaucer's time has become changed into our language of to-day. Primitive tribes were separated by diversity of interests, by diversity of custom, of tradition, of myth and song, of gods and totems, just as are modern nations. Bagehot explained the separation of early groups thus: "The necessity of forming co-operative groups by fixed customs, explains the necessity of isolation in early society."³³ This explanation places the cart before the horse.

Isolation and inbreeding create a more uniform population; variability is reduced. Is not this a hindrance to progressive evolution? Let us hear what a biometrician, Dr. G. M. Morant, has to say about the extent to which variability is reduced. "The most marked exceptions (in the amount of variability) are found for samples from communities which are known to have been segregated for considerable periods, such as certain island peoples, and for these variation is appreciably smaller than for other peoples."³⁴ Inbreeding, then, does reduce variability, but not to an extent which prohibits evolutionary change. Professor Karl Pearson³⁵ estimated that the reduction is not more than twelve per cent. It is not the amount of variation that matters, but its direction; so long as the variations are in the same direction progress will be made.

What of the alleged evils of inbreeding? All depends on the quality of the genes assembled in the group pool; if all are health-giving, then all will be well; but if there be a proportion, even a small proportion, of defective or recessive genes, then repeated mating within a small isolated group will speedily bring defective genes together, so damaging the life of a group. If in small proportion, carriers of evil genes may be eliminated, but if defective



members of a group become so numerous that the group is unable to maintain its place in competition with its neighbours, then such a group is speedily eliminated, its evil genes disappearing with it. Thus it will be seen that evolution, as carried out in a human population divided into small, isolated competing groups, gives quick returns; the passage of a number of generations is sufficient to prove whether a new group is to be a hit or a miss.

When we compare the known representative of humanity at the beginning of the Pleistocene Age with the men who succeeded them towards the close of that period, we cannot help marvelling at the rate at which evolutionary changes had been effected—even if we assume that the Pleistocene Age covers a million of years. At first I was greatly exercised to find an evolutionary machinery which could give such rapid results.³⁶ It was only when the truth of the group theory dawned on me, when I became assured that until the dawn of civilization the total human population of the earth had been divided into a mosaic of small, isolated, competing communities, that I found a machinery adequate for my needs. Nor was I by any means the first to perceive that the division of a population into numerous small independent groups provides exceptional opportunities for a rapid change in racial characters, as is shown by the following passage from a paper written by Professor Metcalf in 1922: "Human racial diversities, I believe, cannot be maintained now that isolation is about to become a thing of the past."³⁷

Human societies, then, are isolated from one another by an instinctive action of human nature. I seem to be alone in regarding human nature as an isolating agency; the reader must judge from my evidence how far I am justified in thinking so. Primitive man was prejudiced in favour of his own community and equally prejudiced against members of other communities; thus was isolation maintained. Nor are such prejudices really dead in the modern world of mankind. Do I, then, maintain that only human groups are kept apart by a mental prejudice? By no means. In Essay V I have already discussed "group consciousness" and the instinctive faculty which all social vertebrate animals have of detecting members of their own community and their aversion to receiving strangers as members of that community. Isolation so maintained is of a psychological nature. Throughout the major part of the vertebrate kingdom the organ

of smell serves as the instrument of discrimination, but in birds the organs of sight and hearing are used for this purpose. In the class of Primates, of which man is a member, the eye and the ear are also the organs used in the recognition of group membership. A tribesman knows his fellows by their features, by their gait, and by their speech.

One other objection may be raised to my theory of mental isolation. In the modern world sex passions break across all racial barriers; they have no respect for frontiers of any kind. Would they not have been equally free and roving in primal times? This problem comes up for discussion in the essay which follows.

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ENDO GAMY, EXO GAMY, AND MONO GAMY AS FACTORS IN HUMAN EVOLUTION

Synopsis.—The author resumes writing after an interval during which events of great evolutionary significance occurred. Extensive hybridization has taken place in the modern world. How sex passion was controlled and restricted in the ancient or primal world. Group opinion is the restraining power in ancient as in modern times. How mating is controlled (1) in anthropoid communities; (2) in primitive human communities. Early human communities were inbreeding or endogamous small societies. A form of exogamy was practised by anthropoid communities. There are certain tendencies towards monogamy among anthropoids. This tendency, the author assumes, became developed in groups of early humanity. The evolution of maternal feelings accompanied prolongation of the periods of pregnancy and of nursing. Westermarck and Frazer on mating in primitive human societies. The evolution of "compound" societies. The origin of exogamy in compound groups. The classificatory system. The origin of group marriage. The rise of individual marriages. In human communities exogamy is combined with endogamy. A review of the theories of exogamy. Its purpose and its effects illustrated. Exogamy was a means of consolidating enlarged compound communities. A consciousness of incest arose late in the evolution of human societies. Social effects of incest. The effects of inbreeding.

At this point there occurred a break in the writing of these essays which deserves to be noted. The preceding essays were written in the first seven months of 1945, Essay XV being finished in the last week of July. It was while so engaged that a momentous event occurred—the unconditional surrender of the German host to the Allied Nations (7th May, 1945). Essay XV being finished, I had then to devote myself to another task—namely, the revision of my text-book on Human Embryology and Mor-

phology, which occupied the remaining months of 1945. It was while I was so occupied that another event of the first magnitude happened—the unconditional surrender of Japan (14th August, 1945), thus bringing the second world war to an end. And now as I take up my pen to resume essay-writing at the end of the second week of January, 1946, an event of even greater significance to students of human evolution than the two just chronicled is taking place under my eyes in London. There, representatives of fifty-one nations have assembled to establish a central government for the whole world. If the United Nations Organization (U.N.O.) succeeds in its Herculean task, then human evolution will have entered a completely new and untried phase. Hitherto evolutionary units (nations) have resorted to war in order to defend or advance their interests; in the new phase co-operation is to replace contention. Hitherto the destiny or evolution of peoples has been decided in the rough and tumble of the world; now man's evolution will have to be planned and *humanized*. Fortunately for me, I need not concern myself overmuch with the future of man's evolution; I am rapidly approaching the eightieth milestone of my life's journey; younger heads will have to unravel the future of human evolution. In the meantime I return in this essay to a consideration of the conditions amid which man made his evolutionary ascent during the long primal period of his history, the period which was succeeded by that of civilization (post-primal) in which we still are.

I picked up the thread of my discourse by returning to the query posed at the end of the preceding essay: "In the modern world sex passions break across all racial barriers; they have no respect for frontiers of any kind. Would they not have been equally free and roving in primal times?" I admit unreservedly the imperious strength of man's sexual passion; of all the mental qualities which go to make up the galaxy of human nature, it is the most difficult to bring under, and keep under, the control of the will. In all the remoter regions of the earth into which men have strayed, singly or in battalion, from the settled homes of the Old World, we find the most ample evidence of the indiscriminate way in which their sexual needs have been satisfied among native peoples. If this is so in the modern world, why was it not equally the case in the primal world? Long-distance migrations which made miscegenation on a great scale possible are modern phenomena;

they became possible in post-primal times when food was produced and ships invented. In primal times every group was surrounded and hemmed in by other groups. More important as a solution to our problem of the restriction and control of the sex passion among primal peoples is a consideration of the manner in which this passion is domesticated and kept within bounds in modern societies. I can best illustrate my thesis by reminding readers of the differing fates which befell the Spaniards and the Englishmen who settled in the New World during the sixteenth and seventeenth centuries.¹ The Englishmen took their wives and their families with them; they established white communities, in which public opinion became all-powerful when moral issues were involved. Marrying natives was condemned and the communities bred white. The Spaniards, for the greater part, left their wives and children behind them; under such conditions white communities could not be established and sex passions demanded, and were given, local satisfaction. I do not claim a stronger sense of race purity for the Englishman than for the Spaniard; all I assert is that the sexual passions of the Englishman were subject to the vigorous and vigilant opinion of his community, while those of the Spaniard were left free of such control. We shall see that in primal communities neither man nor woman could escape from the scrutiny of their group, nor from its condemnation or approval, as the case might be.

If we seek light on the conditions under which primal man mated and begot children, I know of only two sources from which we may obtain it—namely, living communities of chimpanzees and of gorillas—the two anthropoids most akin to man in structure and in mentality—and from such communities of primitive humanity as are still to be found in outlying regions of the earth. To illustrate the manner in which mating and the rearing of young are managed in an anthropoid community² let us take a chimpanzee group of fifteen individuals, made up of three adult males, six adult females, and six young animals at various stages of growth. As we have seen (Essays IV, V, XII), such a group represents a "closed" society; it resents with tooth and nail the intrusion of a stranger into its ranks, much as it does the open enemy which threatens injury; it unconsciously seeks to maintain the purity of its stock of seed or genes, and to hand on uncontaminated to a new generation the stock entrusted to it by a

preceding generation. Our chimpanzee group thus forms an inbreeding, endogamous—I might truly say an incestuous—society; its members stand in the closest blood relationship to each other; the male chimpanzee, so far as we know, when in search of a mate, makes no distinction between mother, sister, or cousin. There must have been a time in the earlier phases of man's evolution when he, too, was equally unconscious of blood relationship, and when endogamy was the standard practice.

There is, however, a considerable body of evidence which leads us to surmise that among chimpanzees, as in all groups of the higher Primates, a compulsory form of exogamy is practised. As many male as female chimpanzees are born, yet in each group the grown females outnumber the males; there is a missing percentage of males. Further, sex jealousy is strongly developed in male chimpanzees, ending in the death or expulsion of one of the contestant males. All who have studied anthropoids in the jungle have observed stray or "rogue" males; but so far no observer has seen one of those rogues crashing its way into a strange group or seeking to entice females to join him and so form a new group. Yet we are justified in believing that such things do happen, and in this way new seed is introduced to old groups, and so a form of exogamy is instituted, very different, as we shall see, from modern human practice. Among gibbons, it is interesting to note,³ young females, as well as males, are expelled from their groups.

Monogamy is not an anthropoid practice; matings at most are for a season. Yet it is of interest to note that among the earlier and oldest form of surviving anthropoids, the gibbon, mating is prolonged and both parents share in the care of their young.⁴ It may well be that this tendency to prolonged mating had appeared early in the human stem, and so have led the human male to take a "paternal" interest in the progeny of his mate. In captivity the male chimpanzee does, on occasion, manifest a paternal interest in the young. In captivity, too, the chimpanzee has sexual intercourse at all seasons; the female is subject to periods of rut which compel her to seek sexual gratification.⁵ Most authorities are of opinion that anthropoids in their native habitat, unlike human beings, are seasonal in their manifestations of sex, intercourse occurring so that the young are born in the spring months of the year.



Before dismissing anthropoid communities from our consideration, it is important that we should note the high development of the maternal "instinct" which is met with among them. As the period of pregnancy increases in length the maternal solicitude of the primate mother increases in power and in duration. The following are the periods of pregnancy in some of the higher Primates:⁶ rhesus monkey, 166 days; gibbon, 209 days; chimpanzee, 235 days; man, 266 days. Broadly speaking, there has been an increase of a month in each of these stages leading from monkey to man; and with each increase there has been a lengthening of the period in which the young needs and receives care after birth. The baby chimpanzee remains a suckling in its mother's care for the first eight months of life; at the end of this period she tends it as it learns to climb and to master gradually the anthropoid gait; it needs her maternal care until it enters its fourth year, when the maternal bonds cease to hold and the young chimpanzee takes its place among the juveniles of the group. The chimpanzee child attains a degree of independence in its fourth year which is equivalent to that reached by the human child in its eighth or ninth year; maternal care is prolonged to a corresponding extent; in the human family the maternal bond is never broken, at least this is so in modern human societies. Thus a chimpanzee group or community is really an extended or consanguine family made up of individuals which are closely related to one another in a genetical sense. All the adults are parents of the group; all the young are the children of the group.

I now pass on to review very briefly what is known of mating and matrimony in communities of living primitive peoples. The way has been cleared for me by the pioneer labours of two men—Westermarck⁷ and Frazer.⁸ Dr. Edward Westermarck died in 1939 at the age of seventy-six; Sir James G. Frazer in 1941 at the age of eighty-seven; both leaving behind them vast monuments of fact and of inference relating to the marital customs of peoples living in a tribal state. From facts cited by them, and from what has just been said about the mating habits of anthropoids, I am convinced that the groups into which primal humanity was separated were inbreeding or endogamous communities. To their inferences there is one I would add here, one relating to the composition of early human groups. It is possible, even at the beginning of the Pleistocene period, when mankind was

represented in Java by *Pithecanthropus*, in China by *Sinanthropus*, and in England by *Eoanthropus*, that mankind was then grouped, just as the gorilla and chimpanzee still are, into single large consanguine families.

About that time, or soon after, I infer that an important change took place in the composition of the primal human group; the group became compound—that is, it was no longer composed of a single unit, as among chimpanzees, but was made up of two or more units (consanguine groups). My reasons for making this assumption are two in number. First, we have to account for the fact that the most primitive human groups known to us are really compound in their composition; secondly, the prevalence and power of the factor of aggregation have been so potent throughout the period of human history known to us. By aggregation I mean the tendency of neighbouring units to coalesce, as a result of compulsion or of negotiation, thus obtaining increased security and power by their union. We have records in all historical times of groups being united to form clans, of clans being united to form tribes, of tribes being united to form small nations, and of small nations being united to form great nations. We must never forget the chief enemy which evolving groups of early humanity had to overcome; the main threat to which they were exposed was neither hunger nor wild beasts, but that which came from neighbouring groups of their own species. Under this ever-present danger compound groups of humanity came to be formed. It may be that they arose, not from the union of neighbouring groups, but from the division of overgrown single units, the newly formed group remaining with the parent group instead of separating from it. The idea I have been expounding was known to Andrew Lang, who wrote: "The largest assemblage of individuals . . . living in amity has the best chance of survival."⁹

To trace the origin of out-marriage or exogamy as practised by primitive humanity, I shall assume that we have before our eyes a compound group or clan just formed by the coming together of two consanguine groups which had hitherto been endogamous or inbreeding (incestuous) units. If these two units, living side by side, continue as inbreeders, then their interests must remain diverse; there can be no unity of action, no social unity. But suppose the two groups agree to exchange their

marriageable young men, then the two groups become linked by the closest of social ties; they come to have a common, dominant interest which gives collective strength to the compound group. In this way I suppose the practice of exogamy was introduced. It was introduced because it was found to give an extended social security. It will be seen, then, that I am of opinion that the earliest form of human mating or marriage took the form of group exchange. Thus in a compound group, so united, endogamy and exogamy were conjoined in practice.

In support of what I have just written I would cite statements relating to tribes of Central Australia given by Frazer. The Arunta is a tribe whose territory lies to the south of Alice Springs. They now practise exogamy, being divided into eight inter-marrying groups or classes. Their tradition, however, is that at one time they were strict endogamists. "Very different," writes Frazer,¹⁰ "was the state of things in the past, if we may trust tradition, the evidence of which points back to a time when a man always married a woman of his own totem (clan.) The reference to men and women of one totem always living together in groups would appear to be too frequent and explicit to admit of any other satisfactory explanation." Both Westermarck and Frazer give lists of endogamous tribes.

To the south of the Arunta and to the west of Lake Eyre is the territory of the Urabunna tribe, of which Frazer gives the following account:—

"In Australia we are not left merely to infer the former prevalence of group marriage from the group relationships of the classificatory system, for a form of group marriage persists to the present time in certain of the central tribes, particularly in the Urabunna, and in the Dieri. In the Urabunna tribe, as in all the tribes with which we are dealing, certain groups of men and women are by birth marriageable to each other. . . . And since in this tribe groups of women are thus common to groups of men, it naturally follows that the children born of such unions are also common to the groups."¹¹

If we bring together two primal groups of humanity, organized as anthropoid groups are, then group marriage of the sort just described is the most probable sequel. The classificatory system,

of which Frazer speaks, implies that all the adults of a group are regarded as parents, while all juveniles of the group are regarded as their children, and therefore as brothers and sisters. On another page¹² Frazer makes this claim: "In short, group marriage explains group relationship, and it is hard to see what else can do so." Here I think the great scholar has placed the cart in front of the horse; the classificatory system was not invented to make group marriage possible; the opposite was the case, group marriage was introduced to fit into the classificatory system, which, as I have indicated, was in existence, at a pre-human level of evolution. Out of the group system of marriage arose the individual practice where mating was arranged between male and female members of linked groups. Later still, in post-primal times, groups were disbanded, and lovers were free to exercise their fancy in the choice of mates. The evolutionary effects of such changes will come up for consideration in a later essay.

Writers are apt to presume that when an enlarged or compound group adopted the practice of exogamy the practice of endogamy or inbreeding was lost. This was not so; the adoption of exogamy but enlarged the group in which endogamy was still practised. Exogamy prospered because of its social effects; it bound together the units of a compound group by marital ties, thus giving it common interests and incentives for common action. A group which practised exogamy would be stronger and more enduring than a neighbouring group whose units retained their endogamous habits; the exogamous groups were selected and survived. Frazer was of the opinion that exogamy had been deliberately introduced as a policy by tribal elders, who were gifted with statesmanlike qualities of mind. That may very well have been the case in later stages of human evolution, but as regards the earlier stages it seems to me that exogamy was forced on primal humanity in search of security rather than by any deliberate choice on the part of its elders.

Let us look very briefly at the explanations which other writers have given of the practice of exogamy by primitive peoples. In Westermarck's opinion¹³ the force which drove man to exogamy were the needs of his sexual appetite; it turned away, so he believed, from what was familiar and at hand; it was attracted and stimulated by the strange and distant. Exogamy

is strictly regulated and ill-designed to answer the purpose which Westermarck ascribed to it. Frazer shared in the explanation given by L. H. Morgan (1877), which he stated in the following terms:¹⁴ "Morgan held that sexual promiscuity prevailed universally at a very early period of human history, and that exogamy was instituted to prevent the marriage or cohabitation of blood relations." Now, to institute measures against incest, men and women must be conscious of the relationships implied by the terms "father," "daughter," "mother," "son," "sister," "brother." Anthropoid apes know nothing of such terms and relationships. When did mankind come to this knowledge? It could not well have been at an early date, seeing that there are still some peoples who are ignorant of the fact that sexual intercourse is a necessary prelude to conception. If, however, we assume that exogamy was instituted, not to prevent incest, but to give solidarity and strength to a community by uniting its sub-groups by marital ties, then ignorance of blood relationship ceases to be a valid objection.

There can be no doubt as to the intensity of the horror which the thought of incest arouses in the human breast; the dread of it is universal. Is, then, the fear of incest one of man's inborn or instinctive fears? Evidence is against such a supposition; the animals most akin to man know nothing of it; nor did early man. The fear of incest has become inherited as a vital element in the acquired *tradition* of every people. To break rules of exogamy is the most heinous of all crimes known to primitive peoples; the sentence is death, even if the infraction is one which is not accounted incest by civilized peoples. To break the accepted values of exogamy is an injury to the solidarity of a social group.

To get at the root of this matter readers must think for a moment of the conditions which would arise in a community if each family were to mate within itself. A multitude of independent inbreeding units would come into existence, destroying all group cohesion. Such a disrupted community must fall speedily apart. This result has been pointed out by several writers.¹⁵ Nor am I alone in claiming as the chief merit of exogamy its power to link together the sub-groups or clans of a tribe, thus consolidating the social life of such a tribe. "Exogamy," said Sir Edward Tylor, "keeps clans together."¹⁶ Lang and Atkinson¹⁷ were of opinion that Nature aimed at



giving a tribe social stability and that the means adopted was the practice of exogamy. Frazer was not blind to the social advantages of exogamy, as the following passage proves: "A system which knit large groups of men and women together by the closest ties was more favourable to social progress than one which would have limited the family group to a single pair and their progeny."¹⁸

I have been seeking to explain the avoidance of incest and the practice of exogamy on the grounds that they give social integration to a compound group. Westermarck, on the other hand—and most anthropologists have followed his lead—sought for a biological or genetical explanation—namely, that the group which inbred underwent a deterioration. The results of inbreeding were discussed in the preceding essay (p. 143), and the conclusion there reached was that all results depend on the nature of the seed involved: if the seed is sound, then the progeny will be sound; if unsound, then the progeny will be unsound. The smaller the group the sooner will it profit from the merits of its seeds, and the sooner, too, will it suffer from their demerits. Small evolutionary groups favour rapidity of evolution.

In the discussion just mentioned less than justice was done to the opinions held by Darwin as to the effects of inbreeding and of outbreeding; I wish now to make some amends. When writing the *Origin of Species* he gave this opinion: "A cross between different varieties, or between individuals of the same variety but of another strain, gives vigour and fertility to the offspring; on the other hand . . . close interbreeding diminishes vigour and fertility."¹⁹ Against this may be quoted the results of close inbreeding obtained by modern geneticists. Rabbits and rats have been closely inbred for many generations with no loss of vigour, fertility, or size of body; the opposite has been the result; all three qualities were increased.²⁰ Darwin admitted that "man is not highly sensitive to the evil effects of interbreeding";²¹ he may have had in mind his own case. He married his cousin and had a healthy and gifted family. More to the point of my argument is his statement regarding the speedy production of a new race by close inbreeding. "With our domestic animals," wrote Darwin,²² "a new race can readily be formed by careful matching of the varying offspring of a single pair, or even from a single individual possessing some new

character." In this, modern breeders agree with Darwin;²³ the closer the individuals of a group are inbred the sooner that group is likely to assume a new form. All of which is in harmony with my claim for the group theory—namely, that a multitude of small competing units provides effective means for securing a rapid evolutionary change.

Darlington is of opinion that "parallel inbreeding and outbreeding would give the best racial results."²⁴ Now, it is this dual form of breeding which rules in anthropoid communities, and which I have assumed to have held also in primal communities of mankind. In a chimpanzee group, for example, the habitual practice is that of inbreeding or endogamy; but this seems to be supplemented by a form of exogamy carried out by the wandering or outcast male.²⁵ If, then, chimpanzees and gorillas are subject to the most effective form of evolutionary breeding, why is it that they have remained anthropoidal apes, confined to the tropical jungles of Africa, while man's simian ancestry has speeded on to a human estate and multiplied so in numbers that the species now covers the whole earth? In my next essay I shall seek for an answer to this problem.

References for this essay appear on page 160.

HUMAN LINEAGE AS OUTLINED IN THIS BOOK

GEOLOGICAL PERIODS

Post-Pleistocene Period
18,000 Years

Pleistocene Period
1,000,000 Years

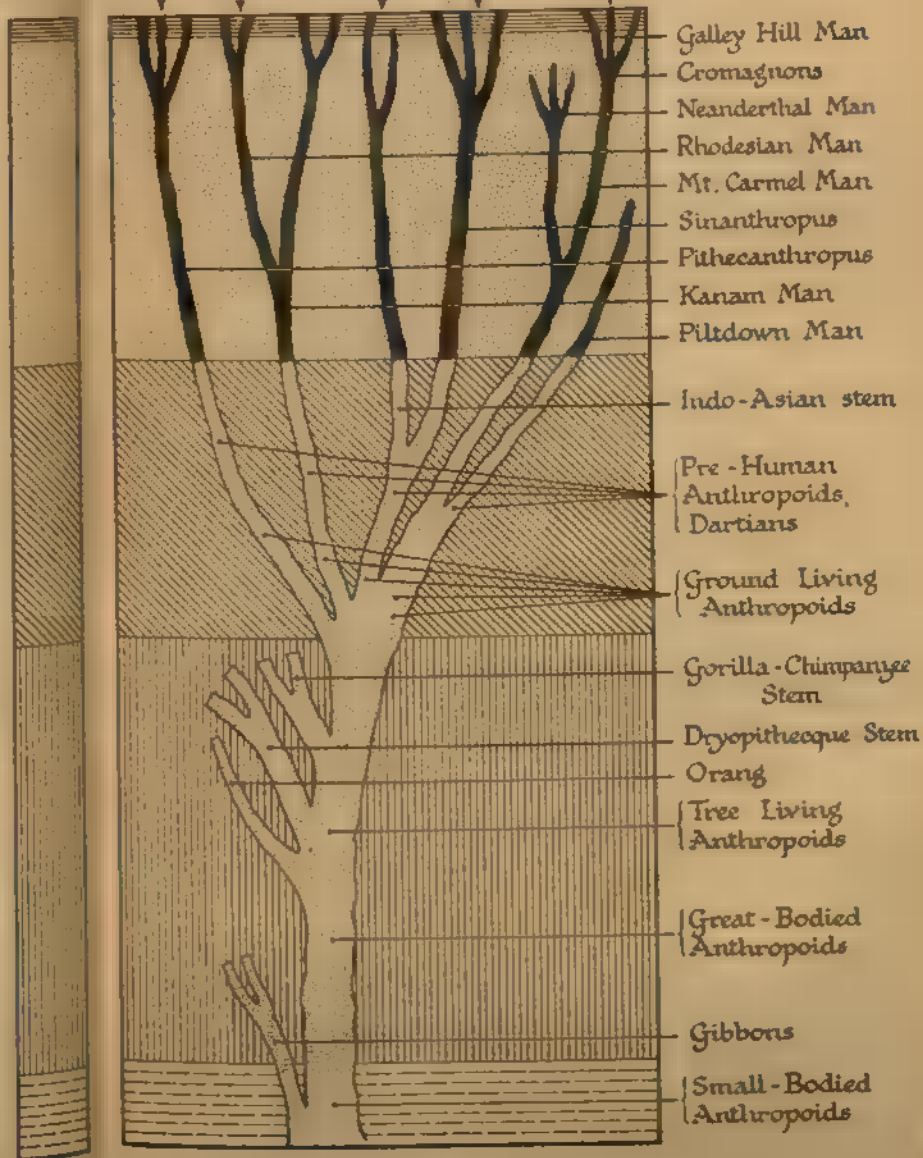
Pliocene Period
7,000,000 Years

Miocene Period
12,000,000 Years

End of Oligocene

THE FIVE MAIN DIVISIONS OF MANKIND

Australasian African Indoeasian Sinasian Caucasian



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- ¹³ Westermarck, see references under 7, especially the first of the essays named and chap. XIX, vol. 2 of his greater work.
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THE CONTRASTED FATES OF MAN AND APE

Synopsis.—This essay seeks to explain why the evolutionary fate of man differs so greatly from that of his co-descendant, the chimpanzee. A clue to this problem is provided by a study of the evolution of the erect or orthograde posture. How the author became drawn into the study of posture. A brief account of the hypothesis he formulated in the last decade of the nineteenth century. The modifications of the orthograde posture in the gibbon, orang, chimpanzee, gorilla, and man. Geological epochs and their estimated duration. So far the earliest evidence for the existence of the orthograde posture comes from the Lower Oligocene. The author's original hypothesis has had to be altered in several respects, but he still holds that the human stock did not separate from that of the great anthropoids until late in the Oligocene period. It was then that postural modifications appeared which gave man and the great anthropoids their respective modes of progression. These modifications confirmed the arboreal adaptations of the great anthropoids, while they set man free from them, thus permitting him to become a ground form. The parable of the postural genes. Evidence that the gorilla and chimpanzee have become less human and more simian in their structural characterization.

Why, then, has evolutionary fate treated ape and man so differently? The one has been left in the obscurity of its native jungle, while the other has been given a glorious exodus leading to dominion of earth, sea, and sky. Of the four surviving forms of anthropoid apes, the gibbon, divided into many species, inhabits those forest lands which lie between Assam and Java; the orang is confined to certain jungle tracts of Borneo and Sumatra; while the chimpanzee and gorilla, which are nearly akin in a structural sense, have their home in the tropical belt of Africa. Students of evolution are of opinion that, at no remote period, as geologists reckon time, anthropoids and man were represented by a single ancestral stock, and that the forms set out upon their

evolutionary journey from the same starting point, all equipped with germinal potentialities drawn from the same common stock. We have seen that anthropoid groups are just as well organized for evolutionary progress as are primitive groups of humanity. How, then, has it come about that the human population of the world now numbers about 2,000 millions, while the anthropoids, if assembled together from the jungles of the East and of the West, would be found to number under, rather than over, one million? What has made man an evolutionary success and his cousins, the anthropoids, numerical failures? If we knew how man came by his great brain, and why the anthropoid brain falls short of the human measure, we should be in a better position to return an answer. We are far from being in a position to explain the rise of the human brain or the comparative failure of the anthropoid brain, but there is another character which may provide the clue we are in search of—namely, that of posture. If we could give an acceptable account of how the anthropoids came by their varying modes of progression and posture, and how man came by his, then we should be able to throw light on why they have remained in the jungle, while he had succeeded in escaping into the open. I am the more willing to follow up this clue because of two circumstances: first, because the evolution of posture in the higher Primates is a subject to which I have devoted much attention, and, secondly, because in tracing the evolution of man's posture, I shall have opportunities of sketching in outline phases in the historical evolution of man and ape.

This is how I became involved in the study of posture. The spring of 1889 (I being then in my twenty-fourth year) found me medical officer to a mining company which had established its camp right in the heart of a Siamese jungle.¹ In the neighbourhood lived several communities of gibbons and groups of various kinds of catarrhine monkeys, of which I shall mention only one sort, a *semnopitheque*, or langur, cousin to the Hanuman, or sacred monkey of India. My attention was soon drawn to the fact that the gibbon held his body, and moved his limbs in climbing, quite differently from the method adopted by the langur and other catarrhine monkeys. While in movement in the trees, the gibbon assumed an upright or orthograde posture; when running along a branch, the animal grasped it with its feet, used its hands and arms for support from overhanging branches,

and thus carried its body at right angles to its plane of progression. It used its arms in the manner of a gymnast on a trapeze. When making its daring leaps from branch to branch, or from tree to tree, the arms were used as the instruments of propulsion. In contrast to this, catarrhine monkeys, such as the langur, move in quite a different way. Running along a branch on "all fours," they hold their bodies parallel to the planes of progression; their posture is pronograde. When making their leaps, they plunge heavily from tree to tree or from branch to branch; the instruments of propulsion are the hind limbs, combined with a sudden extension of the lumbar part of their spines.

When I began a systematic course of dissection, the anatomy of the gibbon came to me as a revelation; the muscles of its back were disposed, not as in pronograde monkeys, but as in the human body; they were modified to maintain the upright or orthograde posture. So, too, with its body; the thorax and thoracic organs, the abdomen and the abdominal organs, all were closely similar to the condition I was familiar with in the human body. Then, as now, the gibbon was regarded as the most primitive and, in a geological sense, the oldest of all the anthropoidal forms. I therefore supposed that Lamarck, and also Darwin,² had been in error when they imagined that the upright posture had come by an ape getting up on its hind limbs; the case of the gibbon seemed to indicate that the erect or orthograde posture came in a downright way—namely, by some form of monkey using its arms as the chief means of support and of progression.

Some years later, when I had made many more dissections and taken a census of the structural characters of anthropoids, both great and small, as well as those of the human body, I framed an hypothesis³ to account not only for the modes of progression to be observed in these orthograde forms, but also to explain how each of these—man, gorilla, chimpanzee, orang, and gibbon—had come by the assemblage of structural characters to be found in their bodies. In my theory I assumed that the erect or orthograde posture had come into the primate world with the evolution of the gibbon (*Hylobates*). I assumed, and I had geological evidence to support me, that from the hylobatian or gibbonish stock there had emerged, at an early period, a stock of anthropoids which differed from all which had gone before by their great size of body; this group I named provisionally the "giant Primates."



Living representatives or descendants of this giant group are man, the chimpanzee, the gorilla, and the orang; many members of this stock have become extinct. The chimpanzee, which at one time bore the generic name of *Troglodytes*, seemed to me the truest living representative of the stage of evolution passed through by the giant Primates, so I named this stage of evolution "troglodytian." Thus it will be seen that my theory postulated three stages in the evolution of the orthograde posture in man and the great anthropoids; first, they passed through a gibbonish or hylobatian phase, then a troglodytian stage, from which man, the gorilla, the chimpanzee, and orang emerged with the particular posture which is now characteristic of each of them. The orang, like the gibbon, has his arms greatly modified to serve as the chief means of support and progression; man, on the other hand, has had his feet, his legs, thighs, and pelvis profoundly modified to serve for this purpose; the chimpanzee uses upper and lower limbs to an equal degree; while the gorilla employs his lower extremities more than his upper in arboreal locomotion. While the anthropoids retain the foot as a grasping organ, man has lost this common heirloom of the Primates; but that at one time his foot did pass through a grasping stage there is ample evidence.

The theory of posture just outlined was formulated in the closing years of the nineteenth century; with the twentieth century came new facts and new considerations necessitating amendments to my working hypothesis. It is with these amendments I now want to deal, but as they involve us in excursions into the geological past we must have a geologist's scale of time for our guidance. The geological ages which concern us, with estimates of their depth of strata and of their duration in years, given in the following table, are based on data provided by Professor Arthur Holmes and other geologists and compiled by my friend Rear-Admiral Beadnell.⁴

| Geological Epoch | | | | | Depth of Strata in feet | Duration in years |
|--------------------------|---|---|---|---|----------------------------|-------------------|
| Pleistocene ⁵ | . | . | . | . | 4,000 | 1,000,000 |
| Pliocene | . | . | . | . | 13,000 | 7,000,000 |
| Miocene | . | . | . | . | 14,000 | 12,000,000 |
| Oligocene | . | . | . | . | 12,000 | 15,000,000 |
| Eocene | . | . | . | . | 20,000 | 25,000,000 |
| | | | | | <u>63,000</u> | <u>60,000,000</u> |

The background of time, in which we are to work, is provided by the last or Tertiary era of the earth's history; the total duration of this era is estimated at sixty million years and is divided, as the above table indicates, into five epochs or periods. In the Eocene no fossil trace of the catarrhine stock has been found—the stock which gave birth to the lines which led on to man, anthropoids, and the monkeys of the Old World. We have to traverse the opening half of the Tertiary era—a period estimated at thirty million years—and so reach the Lower Oligocene, before we find a trace of the beginnings of the catarrhine stock. So far we have had only one glimpse of it—in the Lower Oligocene deposits of the Egyptian Fayum. By 1911 jaws and teeth, representing four Primates of small size, had been unearthed from these deposits.⁶ One of these early Primates, *Propliopithecus*, in characters of teeth and mandible had clear claims to be regarded as ancestral to the gibbon. Although no bones of its body were recovered, there are good grounds for assuming that when they do come to light they will prove that this Primate had evolved, or was evolving, into an orthograde posture. On this somewhat slender basis we assume that the evolution of the orthograde posture was coming into existence some thirty million years ago. Another of the Fayum fossil forms, *Apidium*, has dental characters which foreshadow those of the pronograde monkeys of the Old World; we assume that it retained the pronograde posture of its Tarsioid ancestor. Two other Fayum forms, *Parapithecus* and *Moeripithecus*, have intermediate dental characters and may have been intermediate in their posture. Such, then, is the evidence which permits us to infer that the Lower Oligocene saw the differentiation of the catarrhine stock into orthograde and pronograde forms.

We have to ascend from the Lower Oligocene to a point well within the Miocene, involving an elapse of some twelve or fifteen million years, to reach our next zone of evidence. Here we find the gibbon fully evolved in the fossil form of *Pliopithecus*; great anthropoids abound, chiefly of the *Dryopithecus* family. So far, India has proved the richest source of Miocene anthropoids,⁷ but Europe and East Africa have provided several representatives of the family.⁸ The evidence, scanty as it is, suggests that giant orthograde apes were in process of evolution in the Upper Oligocene, reaching the zenith of their development in the Upper

Miocene and Lower Pliocene. Unfortunately we have to base our knowledge of these great Miocene anthropoids on a study of their teeth and of their jaws; only in a few instances are fragments of fossil limb-bones available to give us guidance as to posture. It has to be confessed that fossil teeth and jaws may mislead us, for teeth which are human in conformation have been found in the fossil anthropoids of South Africa;⁹ while teeth of an anthropoid conformation have been found in an early form of man.¹⁰ It is possible that teeth and jaws we are ascribing to Miocene anthropoids may turn out to belong to ancestral forms of man.

The early Pleistocene form of man which Dubois discovered in Java (1892-93), and to which he gave the misnomer of *Pithecanthropus*, still provides the earliest definite evidence that by the end of the Pliocene period man had attained his full plantigrade mode of progression. From the beginning of the Miocene to the end of the Pliocene epoch, according to our time scale (p. 164), involves the passage of some nineteen million years. It was during this long period, so my theory assumed, that the great anthropoid stock became differentiated into the lines which led to the forms now represented by man, the gorilla, chimpanzee, and orang. There is, however, one recent piece of evidence bearing on the evolution of the plantigrade posture which demands consideration. In 1925 Professor Dart¹¹ announced the discovery of fossil remains of a great anthropoid in South Africa; since then Dr. Broom has found fossil bones of two other kinds of the same type. All are attributable to the Pleistocene, although one may be of late Pliocene date. The South African anthropoids had larger brains than the gorilla or chimpanzee; their teeth were more human than anthropoid in character; fragments of limb bones have been found, and from them it has been inferred that in their posture and in manner of progression these anthropoids were more or less plantigrade. If this latter inference proves to be valid,¹² then we have in these South African anthropoids creatures which were intermediate to man and ape in characters of brain and of teeth, as well as in posture. The South African discoveries throw no light on the date at which man's plantigrade posture was evolved, but they do suggest that man came by his posture while his body was still anthropoidal in its characterization.

Such, then, was the theory I formulated to account for the structural composition of man and ape. Let me now turn to the

"facts" and "considerations" which have led me to alter my original theory. First, there was the recognition that the hylobatian progression of the gibbon was not primary but an extreme specialization evolved out of an earlier and simpler form, in which both upper and lower limbs were used equally in maintaining the orthograde posture. My theory now assumes that the early orthograde Primates of the Oligocene will prove to have been dualists in the use of their limbs—making an equal use of both upper and lower limbs. Secondly, I had to account for the human hand. Man must have separated from the anthropoid stock before their hands had been transformed into grasping-hooks with greatly reduced thumbs. We may safely assume that in the early Oligocene Primates the hands were not modified into grasping-hooks, but had well-developed thumbs and a proportionate development of fingers. It is therefore tempting to suppose that the human stock parted from the primitive orthograde forms of the Oligocene period while that stock had small bodies and hands which still retained their grasping qualities, and that as man's lower limbs became more and more his organs of support, his hands were free to preserve all their more primitive characters. But if we make man's stock break away thus early—some thirty million years ago—we are brought face to face with a difficulty. It is not only size of body that links man to the great anthropoids; he has a large number of other important characters in common with them, such as a prolonged period of pregnancy, of nursing, and of infancy. His brain, although larger and more powerful, is still framed on anthropoid lines; and he shares with them many special structural features. If we assume that the stock which ultimately gave rise to the human form broke away from the primitive orthograde stock in Lower Oligocene times, then we must suppose that man and anthropoids have come independently by the set of structural and functional qualities just enumerated. It seems to me far more probable that man and the great anthropoids remained united in the same stock until late Oligocene times, when a stage was reached characterized by a relatively great size and strength of body. It was as this stage was being approached that I now believe postural differentiation to have been effected. We may safely assume that the early orthograde stock of large-bodied Primates was divided into numerous competitive groups, all of them adapted to an orthograde arboreal

mode of life. In the group ancestral to the chimpanzee and gorilla, upper and lower limbs served equally in the maintenance of posture; in the group or groups ancestral to the orang, the upper limb became the more important means of support, while in the groups ancestral to man, the lower limbs underwent modifications to serve as the chief, or perhaps the sole, means of support and progression. While anthropoids became more and more adapted for an arboreal existence, our pre-human anthropoid ancestry underwent modifications which fitted it more and more for a life outside the jungle.

The stock of large-bodied orthograde Primates we assume to have come into existence in late Oligocene times, and their place of evolution was more likely to have been in the tropical forests of Africa than in those of Asia or of Europe. If a zoologist had been there to examine them, he would have classified them among the large anthropoid apes. He would have noted, too, that in the isolated communities into which this Oligocene stock had become divided there were incipient changes in posture. He would have drawn the inference that the genes which regulate the development of postural structures were in a plastic state.

With this stock of Oligocene anthropoids in our mind's eye we are in a position to answer the question posed at the beginning of this essay: Why has evolutionary destiny dealt so differently with man and the chimpanzee, co-descendants of the same ancestral stock of large-bodied Oligocene Primates? The parable of the talents¹³ points the way to an answer. In this ancient case talents were represented by the germinal potentialities which are handed on from generation to generation by means of genes. When a stock becomes separated into isolated, inbreeding groups, there is never an equal distribution of genes. To one group fall potentialities which are denied to other groups. To the pre-human groups fell that set of genes which were biased towards making the body and brain dependent on the lower limbs for support and progression, and to deprive the hands and arms of their locomotory function and make them the domestic servants of body and brain. The pre-chimpanzee groups were less fortunate in the "draw" for genes. To them fell postural genes of a more conservative nature, genes which worked on developing arm and leg, on hand and foot, so as to make them better adapted to an arboreal life. Thus the postural adaptations

which fell to the chimpanzee confine its species to a life in the jungle, while those which fell to man fitted him to become a denizen of the whole earth.

Man has changed greatly since Oligocene times, but it must not be supposed that the chimpanzee has stood stock-still; it, too, has made evolutionary progress. The Miocene deposits of Kenya have yielded the fossil remains of a large anthropoid which may very well be, as Hopwood⁸ has supposed, ancestral to both the gorilla and chimpanzee. One can conceive the teeth and mandible of this fossil anthropoid being moulded into the forms now found in living chimpanzees and gorillas. Especially noteworthy in the mandible of the Kenya anthropoid are certain features which are also met with in the mandible of early forms of man. These humanoid features have disappeared from the mandibles of the gorilla and chimpanzee; their mandibles have become more and more simian in their characterization. While the chimpanzee has retained a moderate size of body (65 kilos, 145 lb.), the gorilla, particularly the male, has increased in size and strength, the male often attaining a weight four times that of a man or of a chimpanzee. His characters indicate a vigorous action on the part of the pituitary gland. Especially noteworthy, as compared with the chimpanzee, is an increased adaptation of the lower limb for the purposes of support and progression.

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³ See *Nature*, 1911, vol. 85, p. 509; *Revista di Antropologia*, 1916, vol. 20, p. 3. (Lo Schema Dell' Origine Umana.)

⁴ Beadnell, Rear-Admiral C. M., *A Picture Book of Evolution*, 1934, p. 63. Rear-Admiral Beadnell died in 1947 at the age of 76. He was president of the Rationalist Press Association.

⁵ I here give the longer estimate of the Pleistocene favoured by geologists, although I think the evidence as it now stands supports Zeuner's shorter estimate of a little over half a million. The estimate given of the Pleistocene includes also the post-glacial (post-Pleistocene) period, which had a duration of about 12,000 years.

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¹⁰ Keith, Sir A., *The Antiquity of Man*, 1925, vol. 2, p. 687.

¹¹ Dart, Raymond, *Nature*, 1925, Feb. 7, p. 193.

¹² Broom, Robert, and Schepers, G. W. H., *The South African Fossil Ape-Men; The Australopithecinae*, Transvaal Museum Memoir, No. 2, 1946. The discovery in 1947 of the pelvis of one of the fossil anthropoids confirmed the view that their posture was human. (See Broom and Robinson, *Nature*, 1947, vol. 160, p. 153.)

¹³ St. Matthew, XXV, 14.

SEX DIFFERENTIATION AND SEX HORMONES AS FACTORS IN HUMAN EVOLUTION

Synopsis.—The individuals of a primitive evolving community are specialized in body and mind for three forms of activity: (1) for the production of new lives; (2) for the care and nourishment of the young; (3) for the protection of mothers and children. Groups are selected according to the efficiency of these three forms of activity. Doubt as to the innate nature of man's paternal feelings. Sex differences in anthropoids compared with those in man. Differences in cranial markings, in canine teeth, in stature, and weight of body. Stress is laid on the sexual difference in size of brain. The correlation in the development of body and brain as illustrated by the increase and reduction in size of the canine teeth. A quotient expressive of the degree of sex differentiation. The overlap of sexes in point of differentiation. The degree of differentiation determined by group selection. The action of sex hormones on body and brain. The effects of castration. The action of the male hormone on the female body. The mental qualities attributed to women and to men. The action of such qualities in primitive societies. The significance to be attached to the preponderance of the male size of brain. Women retain longer the joyousness of youth. The relationship between the various forms or kinds of human affection.

IN this essay we are concerned with three essential activities carried on by members of every evolving community, whether that enclosed community is made up of anthropoid apes or of primitive human beings. The first of these activities is destined to secure a due mixture of the seeds or genes which circulate within the group. This end is attained by the separation of the individuals composing a community into sexes; in the male, during embryonic development, the parts immediately concerned with reproduction are modified in one direction; in the female

the same parts are modified in another direction. With the differentiation of the sex organs there is also a correlated change in mental organization; the brain of the male is so constituted that when puberty is reached an urge towards the opposite sex becomes imperious; equally compelling are the calls which sex makes on the mentality of the female. If sex passion fails within a community or tribe, then that tribe comes to an end.

The activity just named secures the creation of new lives within a community. The second activity with which we have to do is that which assures the conception, bearing, nourishing, and nursing of these new lives. Here, too, the brain as well as the body of the female, be she ape or be she human, are modified, the breasts to give milk and the brain to give succour. The passions of the mother are so biased that she will sacrifice her own life to save that of her child. "Natural affections," declared Reid,¹ "spring up in the mother's heart . . . as the milk springs up in her breasts." Whether the mind of the male has a corresponding inborn bias is still a moot point. There is credible evidence that among the most primitive of surviving anthropoids, the gibbons, the male shares the care of the young with his mate, but the evidence that affirms the same of the male chimpanzee is much less reliable. For a male chimpanzee to recognize his progeny from that of others he must be monogamous, and of this the chimpanzee seems to be incapable. His habits are definitely polygamous, and, so far as our evidence goes, the same was true of early man. Yet I think there can be no doubt that modern fathers are innately biased in favour of their own children. There is a letter which Darwin wrote when his first child was born that reveals such bias.² A passage from this letter runs as follows: "I had not the smallest conception there was so much in a five-month baby. He is so charming that I cannot pretend to any modesty. You will perceive from this that I have a fine degree of paternal fervour."

The point just discussed—whether or not man comes of a stock in which the males were endowed with paternal feelings—bears on the third of the communal activities we are now considering. This third activity concerns the defence of a community, particularly of its mothers and children, which constitute the core of every live community. To carry out this activity both bodies and brains of males have been modified; their bodies have come



by bone, brawn, strength, and mass; their mentality is biased so that when the need arises, they will sacrifice their lives to save those of mothers and children. They have to varying degrees a fighting spirit born in them; to sustain this spirit they have come by an increase of courage and of a blind and passionate resolution to do or die. Thus I presume that the greater physical strength and fighting prowess of the male have come into being, and been selected, not as Darwin thought, to give one male victory over another in the contest for a female, but arose primarily for group defence. But I also admit that "the law of battle" has tended to strengthen the special characters of the male.

The success of any tribe or group, whether composed of anthropoids or of human beings, will depend on how efficiently and spontaneously these three services are carried out by its members. Sexual passions must be strong and healthy; maternal affections must abound; security must be guaranteed by the prowess of the protectors. The group which is rich in all these qualities will outlast a group less well endowed; such qualities will be favoured and strengthened by "group selection." The extent to which the sexes are differentiated will depend on how far males and females have become adapted to carry out their communal duties. Over-differentiation or under-differentiation may be equally inimical to the life of a group.

To what extent were the sexes differentiated in the simian stock which ultimately gave origin to man? A partial answer to this question may be obtained if we consider the extent to which sex differentiation has been carried in the surviving anthropoid apes, seeing that they are man's collaterals in descent. I have had a long experience in "sexing" the skulls of anthropoids and men, so I turn first to the cranial characters which distinguish the skulls of adult males from those of adult females. In all anthropoid skulls the bony crests which give attachment to the muscles of mastication and of the neck are so strongly developed in males that I cannot remember ever coming across a case which left me in doubt. This is particularly true of the muscular cranial crests of the male gorilla and of the male orang. In the skulls of chimpanzees and gibbons sex differences are less, but always recognizable. It is otherwise when one comes to deal with collections of human skulls; in every hundred specimens there are always some fifteen or twenty which are so poorly marked

that one is left in doubt about their sex. So far as concerns cranial characters, sex discrimination is least marked among modern races of mankind and most in gorillas and orangs. As to the degree of separation of sexes in the earliest forms of man so far discovered, little can be said because the specimens available are so few in number and often so fragmentary in nature. The same handicap prevents any definite statement being made as to the degree of sex separation in fossil forms of anthropoid apes.

The cranial crests of anthropoid apes may be used as indications of fighting power, for their size is largely determined by the development of the anthropoids' chief weapons of offence—the canine teeth. These reach their largest size in the males of the gorilla and orang. In the male gorilla the lower canines rise to a height (in the average) of 9 mm. above the level of the teeth immediately behind them; in the female to a height of 5 mm.; the sexual difference is 4 mm. This sexual difference may also be regarded as a measure of the ferocity of the sexes. In the orangs the canine measurements are identical with those in gorillas, but in chimpanzees the measurements are decidedly less, the canine heights in males being 5 mm., in females 3 mm., the sexual difference being 2 mm. In gibbons, although the canine of the male is the stouter tooth, in height both are alike—namely, 9 mm. This is consonant with the known fact that the female gibbon is as ferocious as the male. In modern races of mankind, although the canine of the male is usually the stouter tooth, there is no difference as regards their degree of projection; in both sexes the canines share the level of their neighbours. Thus we reach the conclusion that, so far as concerns canine development, the sexual difference is least in man and greatest in the gorilla and orang.

Now, it is assumed by many authorities that man has inherited his small canines from his early Oligocene ancestry, and that at no time did he share in the caninization which overtook the anthropoid apes. I, on the other hand, am not alone in holding the opinion that man, in the simian stages of his evolution, had canine teeth which, in point of development, were equal at least to that seen in chimpanzees. Man's canines are formed in the same anomalous position as the large canines of anthropoid apes;³ projecting canines have been observed in two fossil human types—at Piltdown and in Java.⁴

If we believe that in the earlier stages of his evolution man had

large canines, then we are confronted by a problem which is both interesting and intricate. Why did man's canines become reduced? How was the reduction in their development brought about? The first question is the more easy to approach. When man's hands became free and his brain had reached that degree of development which enabled him to become a weapon-user, he would have depended no longer on his canine teeth as his chief weapons of defence; their reduction would then have become advantageous to him. The second question remains: How was this reduction brought about? I do not believe that mere disuse brings about a developmental atrophy; nor do I believe that it can be accounted for by "natural selection" working by itself. We have to presume a factor, of which as yet we have no direct evidence—a factor which works during the development of the embryo and brings about changes in the organization of the brain in correspondence with evolutionary changes in the body. With the decay in man's brain of the physical substratum which supports the instinct to use the teeth as weapons of offence, I presume there also came about a reduction in the bodily structures so used.

After this somewhat abstruse discussion I now turn to the simpler matter of sex differentiation in size and strength of body. In a primitive community, such as is to be found in Central Australia,⁵ the mean stature of women is 126.2 mm. (5 ins.) less than that of the men. A woman's stature is 94 per cent of the man's; the sexual difference is 6 per cent. As regards weight the difference is much greater, the average male weighing 125.2 lb. (57 km.), the female, 95.7 lb. (44.8 km.); the female weighs 76.4 per cent of the male, the sexual difference being 23.6 per cent. Anthropoid and human statures are not comparable, but weights are; unfortunately our knowledge of anthropoid weights is still defective. Of the anthropoids, the chimpanzee stands nearest to man in size and strength of body. The adult male weighs from 60 to 65 km.; the female 45 to 50 km.; the sexual difference being about 6 per cent. The sexual difference among gorillas is very much greater; the adult female weighs about 72 km., while the male weighs twice, thrice, or even four times the weight of the female.⁶ The sexual difference in size is thus of a high order. The sexual difference among orangs, although less than among gorillas, is very much



higher than among chimpanzees. Although the female gibbon has a slightly longer body than the male,⁷ the mean weight of the female is only 91 per cent of the mean weight of the male (5.9 km.). The sexual difference is thus 9 per cent. In the extent to which the male body is differentiated in size from that of the female, man finds a place between the chimpanzee and gorilla, his differentiation being much less than in the gorilla, but greater than in the chimpanzee.

The most reliable, as well as the most interesting, index of the degree to which sexes are differentiated is to be found in weight of brain, or, in the absence of such information, the volume of the cranial cavity which contains the brain. Let us take a sample of modern Europeans first.⁸ The mean weight of the male brain in this sample was 1410 gm.; that of the female 1250 gm. The female brain is thus 88.6 per cent of the male amount; the index of differentiation is 11.4 per cent. In Negroes, although the brain is smaller, the index figure is practically the same as in Europeans. Turning to the aborigines of Australia — representatives of primitive man, we have to deal, not with weights of brains stated in grammes, but with the capacity of the brain chamber stated in cubic centimetres.⁹ The mean cranial capacity of the male Australian¹⁰ is 1287 c.c. (with a range from 1040 c.c. to 1630 c.c.); that of the female is 1145 c.c. (with a range of 1010 c.c. to 1280 c.c.). The volume of the brain of an aboriginal woman is 89 per cent of that of the male; the sexual difference (or index) is 11 per cent. The constancy of an index of 11 per cent for all three races is noteworthy. Taking the chimpanzee as a representative of the great anthropoids, we find that the mean cranial capacity¹¹ of the male is 420 c.c., that of the female 390 c.c., the female capacity being 93 per cent of the male. The index of sex differentiation is thus 7 per cent, compared to 11 per cent for the Australian aborigines. The cranial capacity of the male chimpanzee varies from 350 to 480 c.c., compared with a range of 1040 to 1630 in male aborigines; the range for female chimpanzees is from 320 c.c. to 450 c.c., compared to that of 1010 c.c. to 1280 c.c. in the aboriginal women of Australia. In gibbons the sex quotient is 7.2—nearly the same as in chimpanzees—whereas in gorillas it is 12, being somewhat greater than in human races, while the maximum of sexual differentiation is reached in orangs, with a quotient of 14.



I have gone into the degree of sexual differentiation revealed by a comparison of cranial capacities for several reasons. We learn from them that man, the gorilla, and the orang represent a group of the great Primates in which there is a high degree of sexual differentiation, much more than in the chimpanzee and gibbon, which I infer to stand nearer to the early orthograde ancestry in this character. If we arrange the capacities given for male and female chimpanzees into a continuous series, it will be seen that many males fall short of the female capacities and that many females exceed those of the male. The same is true of a combined series of aboriginal capacities; the sexes overlap. The same overlap is seen if we group the sexes together according to size and strength of body; at one end of the series are those moulded towards the small ultra-feminine frame of body; at the other end of the series those of a robust and ultra-masculine type; between these extremes is a myriad of intermediate types of men and women. One can readily perceive, in the competition of a primitive human group with other groups, that conditions might arise which favoured the group which was strong towards the masculine end of the scale, masculinity being thus selected. Or, opposite conditions might favour feminine qualities of body. In either case it is evident that the sexual balance of an evolving group is determined by the result of the competition of that group with other groups; the group with an optimum sexual balance is a winner. Under the conditions in which humanity was evolved in the primal world, the optimum degree of sexual differentiation is represented by the amount by which the mean cranial capacity of women falls short of the mean capacity of men—namely, by 11 per cent. Whether this will continue to be the optimum amount under modern conditions is a matter which will be discussed in a later essay.

Sex differentiation is fundamental; a boy became a boy at the moment when the egg from which he sprang was fertilized, and so with every girl. If, however, we pass on to the period of puberty, we find certain special factors at work. I shall touch very briefly on the part taken by these factors in determining sex characters. If the testes are removed from a boy, the growth of both body and mind become altered. His voice does not break; if he belongs to a hairy race, he remains beardless; hair does not grow on the usual sexual sites; his skin changes in texture; his

muscular development is lessened; his bones become changed in shape and length. He becomes indifferent to the presence of women. He is devoid of sexual jealousy; he has no spirit to compete, to struggle, or fight. Why should the removal of the testes bring about, not only a suppression of sexual characterization of the body, but also lead to the appearance in it of new features? It has to be remembered that the chemical substances or hormones thrown into the circulation by the testes do not act directly on larynx, skin, hair, and muscle, but produce their effects by acting on the pituitary gland, which is the chief source of the hormones which regulate the growth of sexual and other characters of the body. With the removal of the testes, the pituitary, escaping from the control of the testicular male hormone, changes in its structure and in its action. Thus the non-development of the secondary sexual characters of the body is due to a pituitary failure. One may suspect, too, that the mental changes are also due to a pituitary defect, for the pituitary gland is near to, and closely connected with, the nerve centres of sex. Presently, when we come to deal with the differentiation of mankind into races, the evolutionary importance of the hormonal system will become increasingly apparent.

There is a lack of precise information of what happens to women when their ovaries are removed in girlhood; the effects produced are much less apparent than those which occur in castrated boys. We do know, however, what happens to young women when, as a result of disease, their systems are brought under the influence of the male hormone. Broster¹² has studied many of these cases of "virilism" in young women. Their bodies assume the outward marks of the male; men no longer attract them; maternal affections vanish; they lose all interest in feminine pursuits and duties. Healthy ovarian action is essential for the full manifestation of femininity.

The most complete analysis of the sexual differentiation of men and women known to me is that made by Havelock Ellis.¹³ Let us apply his list of female traits, not to women in general, but to members of a primitive society, so that we may realize the social significance of such traits in early times. When he says that women are more conservatively minded, I take this to mean that they are upholders of tribal traditions, seeking to hand them on to their children just as they received from their own mothers.

Women are said to have an intuitional aptitude in discerning character; such a faculty makes them apt in deciphering the thoughts and motives of their social fellows. They are said to be more susceptible to praise and to blame than men; it would be equally true to say they are more ready to praise and to blame; more given to criticize social behaviour. In this way they establish and uphold tribal opinion. They are said to excel in acting, which I take to imply that they can behave so as to hide their true thoughts and motives—a trait which would be particularly useful in a society of masterful males. Women's nature is said to be more susceptible of suggestion, more docile, easier of domestication, more responsive to instinct, and of greater emotionality. All these qualities fit women to be the staid element of society. "Women," said Darwin, "are more tender and less selfish"; they have the warmer hearts.

It would take me too far afield to tabulate the prevalent traits attributed to men by Darwin and by Ellis. Suffice it to say that they are the characters of mind and body needful for those who are responsible for the protection and welfare of their tribe. They are the qualities which make them successful lovers. In the anthropoid world the male establishes his dominance by the free use of physical force, and this policy, one may suspect, also held in the early world of mankind. One minor trait of the sexual morality of men may be noted here. While they impose a single code of morality on their women, that of chastity, they regard breaches of this code by themselves with a lenient eye. In this respect men are dual codists, while they are single codists as regards their mates.

Readers may have detected two omissions in my discussion of sex characterization. I have given no explanation of the preponderating weight of the male brain. Much of this is due to the greater mass of the male body; the bigger the frame the larger is the administrative outfit in the central nervous system.¹⁴ I do not think that this factor accounts for the whole of the difference. I suspect that a certain part of the male preponderance is due to the specialization of his brain for functions which fall to the lot of the protective male. The other omission refers to changes in mentality which comes with age. Women tend to retain the joyousness of youth to a greater degree than do men. The male anthropoid, when he reaches adult years, turns

sedate, taciturn, and sulky, while the female behaves more as the young do. A corresponding change is often to be noted in men.

Here seems the proper place to devote a paragraph to the discussion of one of the many abstruse problems which dog the footsteps of the student of human evolution. What is the relationship between the mental bonds which link a mother to her child, a lover to his lass, and those which bind together the children of the same family or the members of the same community into a social whole? Have each of these bonds been evolved separately, or is one of them the parent of the others? Westermarck¹⁵ accepted Freud's explanation—namely, that the passionate self-surrender of lovers represents the basis from which the two other forms of instinctive affection arose: Sutherland¹⁶ and many other authorities regard the maternal affections as the evolutionary basis of all the others. There remains a third mode of interpretation—namely, that the special affections of the mother and of the lover are but exaggerations of the social affections. I am inclined to accept the third explanation. When the sex glands are removed in childhood the social aptitude remains, but the mother's love and the lover's passion are no longer developed. This fact is in favour of the primacy of social feelings.

Perhaps the greatest mental difference between man and ape is the exaltation of the faculties which wait upon man's quest of sex. "Love," said Hume, "is cloaked parenthood."¹⁷

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ESSAY XIX

SEXUAL SELECTION AND HORMONAL ACTION AS FACTORS IN THE DIFFERENTIATION OF MAN- KIND INTO RACES

Synopsis.—Darwin called in "sexual selection" to explain racial differences. His conception of the manner in which it acts. Sexual selection in a chimpanzee community. Love-making and mating in a primitive human society. Even in a civilized society mating is mainly local. Westermarck's dictum. Sexual selection favours the survival of the instinctively minded. How far "like will to like" is true. Lovers show a great diversity of taste in their choice of mates. Taste is environmental in its judgment. The problem of sexual jealousy and of marital jealousy. The triple process concerned in bringing about evolutionary change. The production of racial characters by hormone action. The discovery of hormones. Starling's forecast. Examples of hormone action. The pituitary gland. It can bring about orderly as well as disorderly changes in the body. Much still awaits elucidation. Hormones and genes. Even in inbred societies there is a wide individual variation, and hence opportunities of sexual choice. Sexual selection is a minor factor in human evolution. The first step in the differentiation of a new race.

The *Descent of Man* was published on 24th February, 1871, soon after its author had entered on his sixty-third year. At the end of Part 1, in which he summarized his evidence in support of man's evolutionary origin, he had to confess that none of the means he had postulated explained the racial differences which separate Negro from Mongol, or Mongol from European or Caucasian. "We have now seen," he admitted, "that the external characteristic differences between the races of man cannot be accounted for in a satisfactory manner by the direct action of the conditions of life, nor by the effects of the continued use of parts, nor through the principle of correlation . . . but there

remains one important agency, namely Sexual Selection, which appears to have acted powerfully on man, as on many animals . . . it can further be shown that the differences between the races of man, as in colour, hairiness, form of features, etc., are of a kind which might have been expected to come under the influence of sexual selection.”¹ Thereupon he proceeds to Part 2, which is an exposition of his theory of sexual selection.

Darwin used the following simile² to illustrate his conception of how sexual selection brings about evolutionary change: “If during many years two careful breeders rear animals of the same family, and do not compare them together, or with a common standard, the animals are found to have become, to the surprise of the owners, slightly different.” This, he explains, is due to each owner selecting, and thus modifying, the animals to answer to his own taste or standard. A similar effect will be produced, so he inferred, if the males of a community choose their mates, over a long series of generations, according to the standard of taste which prevails in their community. He notes that:—

“the men of each race prefer what they are accustomed to; they cannot endure any great change; but they like variety, and admire each characteristic carried to a moderate extreme. Men accustomed to a nearly oval face, to straight and regular features, and to bright colours, admire, as we Europeans know, those points when strongly developed. On the other hand, men accustomed to a broad face, with high cheek-bones, a depressed nose, black skin, admire these peculiarities when strongly marked.”³

If the Negro steadily sought for a mate with the blackest and glossiest of skins, with thick and pouting lips, with eyes of charcoal, and with the woolliest of hair; if the Mongol sought his bride according to the degree her eyes were of the almond shape, her cheek-bones high, with root of nose duly submerged and hair black and straight; if the European lover were constantly partial to the feminine features portrayed by the sculptors of classical Greece, then sexual selection would be a powerful factor in bringing about the divergence of human races. How far modern evidence supports Darwin's theory will come up for discussion as we proceed. Meanwhile, the extracts just given will place the reader in touch with the main features of his theory.

To begin our inquiry, let us note first the manner in which courting and mating are carried out in a chimpanzee community. Such a community, as we have already seen (p. 149), is a closed society; intruders are driven off. Young chimpanzees are thus limited in their choice of mates; they have to be content with what is produced at home. There is, however, the exceptional case of the "rogue" animal; it may be that he has escaped from his home circle to search for a mate abroad; more probably he has been defeated by a rival male, and so outlawed. Although no one has seen a contest between males for a mate in a jungle community, it is very likely that such contests do occur. The male chimpanzee is an aggressive and imperious lover when in captivity, forcing his embraces several times daily on reluctant females.⁴ Only when he has received, or expects to receive, favour from a female does he show a preferential treatment towards her.⁵ To this degree the male may be said to be a lover. Nevertheless, there is selection in the choice of mates, for preference and aversions are persistently manifested by the younger female animals; such animals seek to make themselves sexually attractive by stamping and whirling movements which may be regarded as incipient forms of dance.⁶ The female begins to menstruate in her ninth year; before then her vulval parts become greatly swollen and tumid; at the mid-menstrual phase, when the ovum is shed, this swelling reaches its maximal development;⁴ it is then that the female obtrudes herself unashamedly on the male. Yet Yerkes⁶ observed a pair seek seclusion before embracing. In chimpanzee communities love is a naked passion dominated by instinct.

In primitive human societies a lover's choice was restricted to his home community, just as much as is the case with chimpanzees. Even in the myriad of living tribal people, where the practice of exogamy is carried out with rigour, a young man's choice of a bride is limited to the young women of his allotted group; often his bride has to be a cousin; nevertheless he has a choice, even if it is restricted. If he selects the bride which seems most attractive to him, thus exercising his taste, his act of selecting will serve in moulding a local type, as Darwin postulated.

Even in modern civilized societies choice of mates is limited by many circumstances—by locality, by class, by nation, by language, and by race. It would take me too far afield to tabulate the

evidence which reveals the extent to which mating still remains local; a few instances will suffice. My first witness is the late Professor Karl Pearson.⁷ "In the Yorkshire dales from which my ancestors came . . . nearly everyone was my fourth cousin or was more nearly related." To give such a result, mating in those dales must have been local over a series of generations. "Fancies of young people," said Galton, "are so incalculable and so irresistible . . . yet ninety-five per cent marry according to the custom of their nation . . . each pair within their own place and circle."⁸ "In German villages," according to Boas,⁹ "fifty per cent of marriages have common ancestry." Gobineau said the same thing of the villages of France. Hocart¹⁰ relates that of fifty-three marriages celebrated within a commune in Egypt, thirty-one were between inhabitants of the same village or commune, thirteen with neighbouring communes, only ten marrying outside the district. Local marriages tend to produce a distinctive local population, but this result must be ascribed to inbreeding rather than to sexual selection.

The evidence I have touched on is altogether against Westermarck's dictum that "proximity creates aversion,"¹¹ and therefore lovers seek their mates outside their native communities. Yet it has to be admitted that there is a degree of truth in Westermarck's contention. Men who go abroad often marry women of foreign nations; they are stimulated by the strange and novel. Here we meet another example of the strange duality of human nature; a man who is most patriotically attached to his native land may yet, in certain circumstances, turn emigrant. A tribesman's mentality changes as he passes from his own into a neighbouring territory. Men are sometimes tempted to do a thing just because it is forbidden. It is in this manner I seek to explain Westermarck's dictum. The "rogue" chimpanzee may have been impelled to seek a mate abroad because of "an aversion to the familiar" of his own group.

Sexual selection became free when men entered civilized life and ceased to live in circumscribed tribal communities. Only under modern conditions are men and women at liberty to mate in the manner postulated by Darwin; even under modern conditions, as we have just seen, their choice is limited by many circumstances. Although sexual selection has played only a minor part in the production of human types and races, there is a sense

in which it is of the utmost evolutionary significance. If it is really true that love is "cloaked parenthood," as Hume supposed, and if those in whom love abounded mated in a larger proportion than those in whom it was less developed, then the highly sexed, the children-producers, would be favoured, and the founts of fertility would be always full to overflowing.

Love may abound and yet lead to childless marriages; love may be prostituted. But in such cases there is elimination—elimination of the stock of those who have voluntarily dissolved the bonds which link love to parentage. In this way sexual selection secures the perpetuation, as well as the reproductive health, of a community. As regards sexual selection, it is the instinctively minded parents, rather than the rationally minded, who hand on their reproductive qualities freely to the next generation.

In this paragraph I am to tie together in a single bundle a number of minor matters connected with selection of mates. Does the rule "like will to like" hold in a lover's choice? Darwin believed it was so among certain animals,¹² and Julian Huxley¹³ has cited the case of a white (albino) community of Indians in Panama who, being denied partners by neighbouring coloured communities, were left to find mates among themselves. The latter is an instance, not of selection, but of rejection, and is paralleled in civilized communities by those cases where the maimed, the deformed, and the grossly diseased are left uncourted and unwed. The tastes of lovers are infinite; there is the utmost diversity of mind and body among women, yet there are very few that fail to answer to some lover's ideal. "Love is blind," it is said; if not blind, it is certainly strongly prejudiced; bystanders never see lovers as lovers see each other. A lover's taste is based, not on any standard which has been born within him, but upon the faces and fashions on which his infant eyes opened and amid which he grew up. Taste is a local tradition; a white child reared in a black community, or a black child brought up among whites, will model its taste on the faces and manners of those by whom it is surrounded. A lover's taste, then, usually works within the limits of a community, and so diverse are its ideals that it tends to produce within that community, not a single type, but a great diversity of the local type. In brief, sexual selection is but an adjunct of the evolutionary

machinery which works so as to give differentiation to the members of a local community.

Why is love so often accompanied by jealousy? We have seen (p. 58) that competition is an essential part of the machinery of evolution; jealousy is the spur or whip which urges competitors on towards their goal. It is the painful passion which seizes contestants when they fear their ambition is to be frustrated, urging them on to obtain by foul means what they cannot win by fair dealing. Jealousy is deaf to reason; it gives the strongest of biases to thoughts and feelings. Under free conditions sexual selection is a contest between lovers for the same desirable bride. Being a competition for sole possession, it is naturally attended by jealousy on the part of contestants. It is not a passion peculiar to man; all through the animal kingdom jealousy arises wherever there is a contest for attention, for affection, or for sole possession; but the high organization of man's emotional nature renders his pangs of jealousy far beyond those felt by other animals. Jealousy, then, is the spur which urges lovers on, so that the fittest may receive his reward.

When the mating contest is over and the competition ended, why should husbands (and wives) become jealous? The contest is, in reality, not over; former rivals still exist; the husband may find his mate exchanging glances with other men, which, by rights, ought to have been his. Darwin, in the following passage,¹⁴ states his belief that marital jealousy is inherent in man's nature: "The most probable view is that man lived aboriginally in small communities each with a single wife, or if powerful, with several whom he jealously guarded against all other men." Against Darwin's view we have evidence that the practice of "wife lending" was widely spread among primitive peoples; the Eskimo and Todas¹⁵ are said to be devoid of marital jealousy. It seems to me more probable that the ban against unchastity, like that against incest, is part of a domestic tradition, instituted to prevent disruption of families, and has no instinctive basis in human nature. This is supported by the fact that the most highly civilized peoples (who are also the most competitive) are those in which marital jealousy most abounds. I agree with Hume that:¹⁶ "Chastity would never have been thought of but for its utility in safeguarding the interests of the children."

Darwin called in sexual selection to explain the origin of the

diverse varieties or sub-species into which mankind has been demarcated. We have seen (p. 129) that the evolutionary process is carried out by the simultaneous action of three factors. First, there is *production*—the production of new heritable traits of body and of mind. Secondly, there is the *competition* between individuals and between communities. Those in which new characters have appeared may be stronger than those devoid of them. Thirdly, there is *selection*, the increase, spread, and survival of those best fitted to meet the needs of life, as well as the decrease and, ultimately, the elimination of those less well fitted. So far I have considered only two of the factors concerned in the evolution of races by the action of sexual selection—namely, the competitive and selective factors. We have now to inquire into the productive factor, the means by which races have been given their distinctive features of face, body, skin, hair, and brain. This involves a brief exposition of the modern and still very defective doctrine of hormone action.

Early in the twentieth century, some twenty years after Darwin's death, the discovery of hormones and of their action threw a new light on the origin of racial characters. Such a discovery would not have taken Darwin by surprise, for when discussing the possible origin of such characters in *The Descent of Man*¹⁷ he wrote as follows: "We must not be too confident in deciding what modifications are of service. . . . It is also well to reflect on such facts as the wonderful growth of galls on plants caused by the poison of an insect." What Darwin here calls a poison came to be recognized as a hormone—a chemical substance which has the power to induce or cause growing tissues to assume new forms. The tissues of the same plant can be made to produce galls of many kinds. "Many forms of gall-producing insects," writes Julian Huxley, "are distinguished solely or mainly by the type of gall to which they give rise."¹⁸

It was Ernest Starling¹⁹ who gave the name hormone to chemical substances which control the physiological actions of the body. His, too, is the first clear enunciation that hormones control growth as well as function. In evidence of this I cite the following passage from his Croonian lectures of 1905:—

"If, as I am inclined to believe, all the organs of the body are regulated in their growth and activity, by chemical

mechanisms similar to those I have described, an extended knowledge of hormones and of their modes of action cannot fail to add largely to that complete control of the body which is the goal of medical science."²⁰

Each year which has gone by since 1905 has brought evidence in support of Starling's forecast; it became clear that the racial characterization of the human body is under the control of hormone action.²¹ The effects of castration, as was mentioned in the preceding essay, have been known from earliest times, but it was the discovery of hormone action that revealed the means by which such effects were produced. In 1885 Dr. Pierre Marie of Paris gave the name of "acromegaly" to a disordered growth of the human body, a disorder which, in the course of a few years, transforms the external appearance of the men and women who suffer from it. In all such cases it was found that the pituitary gland, at the base of the brain, normally small in size, had undergone an irregular enlargement. The explanation of this disorder came with the formulation of the doctrine of hormones. The pituitary gland has proved to be the headquarters for the production of the hormones which control growth. Then, later, from 1924 onwards came the knowledge that chemical substances akin to hormones control the development of the embryo.²² In this way anthropologists of the twentieth century were given a clue to the origin of racial characters.

Disorders of the pituitary affect stature; they give rise to giants and also to dwarfs; they can strengthen the brow ridges, alter the shape and size of nose, chin, and face; they can alter the texture of skin and of hair; they can alter the proportion of limbs to trunk. These alterations are due to disorderly action of the pituitary, but there are many instances of orderly increased action. For example, the majority of the characters wherein the gorilla differs from the chimpanzee can be traced to an exaggerated action of the pituitary.²³ Evidence of this is to be seen in the gorilla's great jaws, his bar-like supraorbital prominences, his enormous cranial crests, his large teeth, his massive body, and his extreme strength of muscle. Evidence carrying the same implication is met with in certain human families and also in some human races. Much still remains to be explained. There are forms of dwarfs such as those who are the subjects of achondroplasia²⁴

and those suffering from "mongolian" idiocy which we are justified in regarding as examples of disordered hormone action, but the exact nature of the disorder remains obscure. In the achondroplasiac dwarf we meet with the flattened, retracted nasal bridge which prevails in peoples of the Mongolian stock. We have reason to believe that the formation and deposition of pigment in the skin are under hormone control, but exact evidence is still lacking.

Such, then, is the present state of knowledge regarding the production of the external characters of the body, which, of course, include those which discriminate one race of mankind from another. How far can sexual selection alter the production of such characters and thus change a race? Let us suppose we have before us an isolated human community of early primal times. Within such a community there is a certain stock of genes, among them those which hand on the determiners of hormones. Seeing that it is an inbreeding community, it might be expected that all members of the community would be cast in the same mould. This is not so. Only in the case of identical twins, which arise from the same ovum, do we meet with approximate identity. In a large family, born to parents who are cousins, we note that brother differs from brother, and sister from sister, although all may show a degree of resemblance. No two eggs, even of the same parents, receive the same allotment of the genes which determine the external characteristics of the body. Thus in our primal community there is still variety on which a lover's choice can be exercised. If that choice were uniformly to fall on a particular kind of face, then in the course of generations that type of face would prevail in the community. As we have seen (p. 186), the lover's taste is not uniform but rather indiscriminate in its action. Sexual selection cannot by itself bring about a discrimination of mankind into races, although it may assist in the differentiation of local breeds.

In another essay I shall have to go more closely into the manner in which new races of mankind are produced. There is a preliminary step in my inquiry which I may profitably take now. Let us suppose that the primal group mentioned in the preceding paragraph has greatly increased in numbers, so that part of it, to get enough to eat, has to seek a new home and territory. The genes which the colonists carry with them is a sample of the

stock of genes circulating in the parent community. It is but a random sample of that stock, and is likely to be richer in certain genes and poorer in others than the mean of the parent community. Thus in the setting up of a colony we have a new assortment of genes and hence the production of men and women who differ in details of form from those of the parent community. The essential factor in the production of races is not sexual selection, but the differentiation which goes on in endogamous communities.

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ESSAY XX

FCETALIZATION AS A FACTOR IN HUMAN EVOLUTION

Synopsis.—There is a stage in the development of the chimpanzee *fœtus* when the distribution of hair is similar to that of the human body. Hairlessness in man has come about by the retention of a *fœtal* stage of his development. The law of recapitulation is invalid for such characters. To the process which leads to the retention of *fœtal* characters Louis Bolke gave the name of "*fœtalization*." In the development of the human body new characters are interpolated with the old. Examples of *fœtalization*. The palato-cerebral ratio. The movements of the foramen magnum. Man's orthognathy. Man's skull retains *fœtal* characters. Certain traits of the Mongol race are of *fœtal* origin. The influence of endocrines or hormones. The correlation in development of man's brain and body. The process of *fœtalization* also affects mental qualities. The prolongation of the periods of life. A definition of these periods. In man the period of active brain growth has been greatly extended. The prolongation of the "*preparatory phase*" of life. In this phase new and untried features make their appearance. These may, or may not, have a survival value. There is a similarity between the "*progress*" made by man under conditions provided by civilization and the advance made in the evolution of his brain and body under conditions afforded by the preparatory phase of his existence.

In the year 1908, when I was entrusted with the care of the Museum of the Royal College of Surgeons of England, there was exhibited in one of its galleries a specimen which had been added in the time of my predecessor, Sir Richard Owen. It was the *fœtus* of a chimpanzee in the seventh month of development and therefore within a month of term, the period of pregnancy in chimpanzees being eight months.¹ Most visitors passed it by with merely a casual glance, believing it to be an example of a

human foetus exemplifying one of the darker-skinned races, for the skin was *café-au-lait* in colour and apparently bare. The head was of goodly size and crowned with hair such as is seen in the scalp of a newly-born child. In the final month of development the chimpanzee foetus becomes clad with hair, and is born a hairy animal.² The face, which was small, was turned down on the breast, while the lower limbs and feet were tucked against the belly. Those who looked critically at the specimen were surprised to find that the feet were provided with great toes which had the shape of thumbs.

The lack of interest displayed by visitors in the specimen may have been due to a belief which was widely prevalent at the end of the nineteenth and at the beginning of the twentieth centuries—namely, that all the characters to be seen in a foetus are repetitions or recapitulations of ancestral traits. Darwin so regarded them.³ Haeckel⁴ formulated this belief in his “biogenetic law,” which read as follows: “Ontogeny, or the development of the individual, is a shortened recapitulation of phylogeny, or the evolution of the race.”⁵ If the law of recapitulation represented the whole truth, then we should have to suppose that the chimpanzee comes of a hairless human-like ancestry which later put on a hairy dress. Such is an impossible interpretation, for hairiness is one of the most ancient of mammalian characters, and all the records of the rocks are against it. The foetal chimpanzee, in its hairless stage, is not repeating an old or ancestral feature, but is exhibiting a new one. The stages passed through by a developing animal are not only retrospective; they are also prospective. In the development of the body new characters are interpolated with the old.

Man being a Primate, we must assume that he shared at one time in the universal hairiness of his Order. We may also assume, seeing his structural affinity to the chimpanzee, that he, too, in foetal life passed through a hairless stage. In his later foetal stage—that is, during the eighth and ninth months—man retains this hairless state, and thus we have an acceptable explanation of how man came by one of his most peculiar characteristics. The hairless state is only one of the many foetal traits which have been retained, and so have become incorporated in the structure of adult man. The passage of foetal characters into adult life was named “foetalization” by my friend Louis Bolk (1866-1930),

who held the chair of Human Anatomy in the University of Amsterdam. He began his investigations in 1900, but was by no means the first to recognize that many of man's special characters are foetal in nature; anatomists before his time were familiar with the idea.⁶ One example will suffice. Havelock Ellis⁷ after comparing the infantile characters of ape and man ends with this passage: "We see, therefore, that the infantile condition in both apes and man is somewhat alike and approximates to the human condition. . . . We might say that the foetal evolution which takes place sheltered from the world is in an abstractly upward direction." Nevertheless, it was the inquiries and publications made by Bolk during the first three decades of the twentieth century which compelled students of human evolution to recognize that the majority of man's structural peculiarities have come into being during the foetal stage of his existence and have been carried over to adult life by the process he named "foetalization."

The hairless state of man's body, the character just discussed, is one which appears in a foetal stage in the development of the anthropoid body, but in man's body is carried over from the foetal stage to the adult. There are many other characters which show a similar transference. Man is remarkable for the large size of his brain and the small size of his face; this, too, is a feature of the anthropoid at birth. To give precision of statement of the relationship of brain to face, I have been in the habit of using a formula which is constructed as follows:⁸ The volume of the cranial cavity, stated in cubic centimetres, is employed to express the size of the brain; the area of the dental palate, stated in centimetres square, is taken as an index of face development; the palato-cerebral formula gives the relationship of palatal area to brain volume. Thus in the skulls of European men it is quite common to meet with a palate of 25 cm.² combined with a cranial capacity of brain volume of 1500 c.c. In such instances 1 cm.² of palate corresponds to 60 c.c. of brain; the palato-cerebral ratio is 1:60. In Australian aborigines the palate is larger and the cranial capacity smaller than in the European, the ratio being 2:40. Turning to the male chimpanzee, we find a palatal area of 46 cm.² conjoined with a cranial capacity of 390 c.c.; the palato-cerebral ratio is thus 1:8.5. In the adult male gorilla the ratio is even less—namely, 1:7. But if we turn

to the ratios of these anthropoids at birth, we find an approximation to the human ratio. At birth a chimpanzee has a palate measuring 13 cm.², a cranial capacity of 260 c.c.; its ratio is thus 1 : 20. In the gorilla at birth the ratio is 1 : 22, while in the newborn child it is 1 : 50. Thus we may ascribe the smallness of man's face and the largeness of the brain-containing part of his head to a tendency to prolong an infantile stage into adult years. We note, too, that man's infantile stage is an exaggeration of that seen in the young of anthropoid apes.

In the newly-born monkey and ape the great foramen in the base of the skull, by means of which the cranial cavity communicates with the spinal canal, is situated near the centre of the base. Man is the only Primate which retains this central position. This may be described as a foetal inheritance. In all other Primates, as the permanent teeth erupt and the jaws and face grow, the opening, by a series of complicated growth changes, is moved backwards until it comes to be situated at the hinder end of the base.¹⁰ There is a certain degree of movement in a backward direction in primitive human skulls, a greater movement in that of the female chimpanzee; it reaches its maximum, so far as orthograde Primates are concerned, in the skulls of old male orangs and gorillas. A suckling monkey, clinging to its mother's breast, has to carry its head in the human position; hence the central position of the foramen magnum in the skulls of newly-born apes. Movement of the foramen sets in when the suckling period is coming to an end. This infantile stage has become permanent in man.

Another growth movement, closely associated with that just described, gives man another characteristic feature—namely, his face. This is attached to the front part of the base or floor of the skull and descends more or less vertically from that base, whereas in all the anthropoids it passes to a greater or less degree in a forward direction. Man is orthognathous; the anthropoids are prognathous. At an early stage of development the face in all monkeys and apes is bent backwards under the base of the skull, owing to the part of the base to which the face is attached being bent downwards. As development goes on in the skulls of foetal anthropoids, the anterior flexure of the base is undone, the face thus assuming its forward or prognathous position, whereas in man the foetal flexure is retained to a greater or less degree, thus



giving an orthognathous position to the human face.¹¹ Here again we have an instance of foetalization.

Foetal and infantile anthropoids have bulging, prominent foreheads, devoid of ridges. With the eruption of the permanent teeth, the forehead of the chimpanzee becomes transformed. Great supraorbital ridges are developed; the frontal bone is remodelled and becomes low and receding. In man, and also in the orang, the forehead retains the foetal characters to a greater or less extent. The forehead of women is usually more foetal in its characterization than that of men. In the extinct Neanderthal race, and in some other ancient races of mankind, the forehead went through changes similar in kind to those seen in chimpanzees and gorillas; in the more civilized races the infantile form of forehead is often retained.

Many other human characteristics of body make a transitory appearance during the foetal life of anthropoid apes. Three further instances may be cited now. Round-headedness (brachycephaly) appears in the earlier stages of foetal development of the great anthropoids and also in those of man.¹² In the orang and in many human races this character is retained in the adult. Then there is an example on which Bolk laid great stress.¹³ In the face of a typical Mongol there is a combination of three features: (1) the nasal bridge is low and retracted; (2) a fold of skin, the epicanthic fold, passes from the root of the nose upwards to join another fold above the upper eyelid; (3) the eyeballs are protuberant. In Mongolian peoples only does this combination of foetal characters persist into adult life; they put in a temporary appearance in the foetal stage of a certain proportion of Europeans; seventy per cent of Hottentots retain them. The third instance I am to cite concerns the prominent bony crests which are developed on the skulls of anthropoid apes and give attachment to the mighty muscles of mastication and to those of the neck which move the head. In the foetal and infantile stages of anthropoid development these bony crests are absent; the cranial bones are smooth and relatively thin; the muscles just named expand over the surface of the skull, bony crests being thrown up for their increased attachment. Crest formation goes farthest in the male gorilla, to a much less extent in the female chimpanzee, while man passes little beyond the stage reached in the infancy of the ape.

The example just cited is both interesting and instructive for the following reason. In the subjects of acromegaly the jaws again begin to grow, the muscles of mastication and those of the neck to expand their origins, and prominent bony ridges are formed.¹⁴ These changes are brought into being, or stimulated, by a hormone or a combination of hormones thrown into circulation by a disordered pituitary gland. We may justly infer, then, that the development of cranial crests is controlled by a hormone or hormones formed in the pituitary gland; and that delay in the development and growth of bony crests is due to a reduced hormonal action. The various roles played by the pituitary hormones in the development and characterization of the body are handed on from parents to children by means of genes. These genes, we must infer, can undergo changes in the course of evolution. In the male gorilla, for example, the genes responsible for crest-development have undergone changes which lead to a more durable and more vigorous hormonal action, while in man gene changes have limited this action both in the time of its application and in the strength of its effects.

In the evolution of man there has been a great increase in size and in power of the brain; there has also been a reduction in size and in strength of the teeth and jaws. In peoples living under civilized conditions, if there is no indication that the brain continues to increase in either size or power, there is evidence that teeth and jaws tend to a reduction. We may say that the process of foetalization goes on in civilized communities, but such an explanation leaves this question unanswered: Why is increase of brain accompanied by a reduction of all parts connected with mastication? These changes are somehow correlated; there must be a factor, or a combination of factors, at present unrecognized, which during embryonic development correlates the organization of the brain with that of the body. As we have seen (p. 86), the brutal anthropoid has a disposition to attain his desires by the use of physical force, whereas the disposition of modern man, in whom the process of foetalization has wrought its full effects, is to settle his quarrels not by force, but by the milder means of understanding and stratagem. Changes in man's body have been accompanied by co-related changes in his mentality.

The process of foetalization is applicable not only to characters of the body, but also to those of the mind. Apes, in their early

youth, like children, are full of life and play. The adult anthropoid, particularly the old male, is serious, morose, and short of temper. In mankind there has been a tendency to carry the joy of youth and the carefree spirit into adult life; the retention of a youthful mentality is commoner among women than among men.

Man is the most slowly growing of all the great Primates; there has been a prolongation of all his periods of life within the womb and outside the womb. This matter is related to the subject just discussed; foetalization is a prolongation of foetal or infantile structures into adult life. The subject we are to consider now is the prolongation of life—of all periods of life—and the bearing of this prolongation on new developments in the evolution of man.

The life of man may be divided into four periods. There is first the intra-uterine or foetal period of 266 days (9.5 lunar months); secondly, the infantile period extending from birth to the eruption of the first molar, the earliest of the permanent teeth, a period of six years; thirdly, there is the juvenile period, one of fourteen years, extending from the sixth to the twentieth year, during which time the permanent dentition comes into use; fourthly, there is the adult period, covering in favourable cases a space of fifty years. The first thirty years of the *adult period* covers the years of female fertility; the later twenty years, the time of decline. The duration of the corresponding periods in the chimpanzee is as follows:—¹⁵ Intra-uterine, 235 days (8.4 lunar months); infantile, three years; juvenile, eight years; the adult some thirty years, the first twenty of which are believed to be the fertile years of the female. Thus, compared with the chimpanzee, man's intra-uterine period has been extended by one month; the infantile, three years; the juvenile, six years; the adult, some twenty years. We may take the rhesus monkey as representative of the smaller and earlier primate stock and compare its periods with those of the chimpanzee. In the rhesus the intra-uterine period is 166 days (6 lunar months), two months less than in the chimpanzee; the infantile period, 1.5 years, half the length of the anthropoid; the juvenile period, 6.5 years, being 1.5 years shorter than in the chimpanzee; the adult period, some twenty years, ten years less than the estimate for the anthropoid. With the evolution of the large-bodied orthograde Primates

there came a prolongation of life periods, a trend which reached its climax in the evolution of man.

Man is remarkable, not only for the prolongation of his life periods, but also for the prolonged period of *active* brain growth. In the gibbon, and the same is true of the rhesus monkey, the active period in the growth of the brain is reached at the time of birth. Their brain has then attained about seventy per cent of its adult size. After birth their brains grow at a rate which has a correspondence to body growth. Man, on the other hand, is born with his brain only twenty-two per cent of its adult size. There is a rapid increase during the first and second years of life, the seventy per cent figure being reached early in the third year. Thereafter the tempo of increase bears a relationship to the growth of the body. In the chimpanzee and gorilla there is a brief period of active growth of brain after birth, the seventy per cent phase being reached early in the first year. Thus the period of active brain increase in the rhesus monkey lasts for only six months, in the chimpanzee for eleven months, while in man it is extended to thirty-six months. Herein we see that an important, if not the most important, feature of human evolution—namely, the time taken to assemble and to organize the myriads of nerve cells and of nerve tracts which enter into the structure of man's brain exemplifies the law of foetalization.

The opening part of this essay was centred on characters which appeared in foetal life and later became transferred to adult life. In their foetal and infantile stages the young of man and of ape are large-brained and small-faced. It must be noted, however, that in these stages neither the utility nor the efficiency of brain and face is tested. In the foetal stage the mother's body supplies nourishment, warmth, and protection. Both brain and jaws are idle; they have no duties to perform. In the infantile stage the needs of the young are supplied by parental care. The foetal and infantile periods make up what may be named the "preparatory phase" of development, the phase in which structures are being built up before they are brought into use. In the rhesus monkey the preparatory phase is short—namely, about two years; in the chimpanzee it has been nearly doubled (three years and eight months); in man it has again been doubled (six years and nine months). Now, although it is in the preparatory phase of development that new features of the body become

manifest, it is not then that they really came into being. Their presence in the foetus has been "determined" or preceded by changes in the germinal seeds or genes which are responsible for their development. In the preparatory phase new characters of many kinds may make their appearance; they may be useful or useless, necessary or superfluous; as long as they are not lethal the foetus and infant survive. On entering the maturation or juvenile phase these new characters are "tried out," but it is only when the adult phase is entered that their fate is known. If such characters are useful and increase the chances of survival, then they are preserved; if not, then they are finally eliminated. Man's prolonged preparatory phase provides increased opportunities for the "try-out" of new characters arising from gene mutations.

An instructive parallel may be drawn between the "progress" made by man under the conditions provided by civilization and the "advance" made in the evolution of his mind and body under the conditions which mark the long preparatory phase of his development.¹⁶ Civilization was made possible by the accumulation of "capital." It was capital which gave men leisure to think, to invent, to decorate life, and thus enhance its value. Capital permitted men to explore and bring into use those latent gifts and faculties of their brains which, having no utility value, were left unexploited in primal times. During the preparatory phase of life the foetus and the infant live on capital. The foetus lives on capital provided by the mother's body; the infant on capital supplied by parental care. The conditions which prevail in the preparatory phase of human life make evolutionary experiments possible on a large scale. The results of this experimentation, the alterations of structure and the modifications of function so introduced may, or may not, have a utility value; they may represent the first stage of a process which is valueless until the final effective stage is reached. It was under the conditions provided in the preparatory phase that man came by the great potentialities of his brain, potentialities which he exploited in more modern times amid the opportunities provided by civilization. It was in the preparatory phase that the more recent modifications of man's body came into being, modifications which were carried into adult life by the process of foetilization.

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CROSSING THE RUBICON 'TWIN APE AND MAN

Synopsis.—The bearing of the discovery of extinct forms of anthropoid apes on the problem of human origin. An account of the discoveries. The evidence produced by Dr. Broom proves that the South African anthropoids were more akin to man than the author had originally supposed. The chief characters of the South African anthropoids. The difficulty in distinguishing man from ape. Darwin held that no line could be drawn between them. The author proposes to use the size of brain as a mark of distinction. The test applied to the hominids of Java and to the South African anthropoids. An imaginary group is followed across the frontier which separates ape-dom from man-dom. The instincts of the anthropoid (anthropoid nature) became the instincts of man (human nature). The relation of intelligence to instinct. The mental changes which accompanied an increase of the brain in mass and organization. The beginnings of speech. Man's emotional nature was enriched as his power of understanding increased. Why such an enrichment was rendered necessary. The place of the South African anthropoids in Dr. Broom's scheme of human evolution. Their place in the author's scheme of evolution.

My argument had reached its present point when, in the spring of 1946, there came to me from South Africa a monograph entitled *The South African Ape-Men: The Australopithecine* by R. Broom, F.R.S., and C. W. H. Schepers. The senior author, Dr. Robert Broom, is my friend and contemporary; we were both born in the same year, 1866; we were both bred as medical men in Scotland; both of us have developed, as a main interest, a study of extinct forms of life known only by their fossil remains: his chosen field lying in the transitional forms which lead on from reptile to mammal; mine in the narrower field which leads from ape to man. In one sense I was the more fortunate; my office provided me with my opportunities,

whereas he had to pitch his medical tent in such parts of the earth as supplied his fossil needs. Hence he established himself in medical practice in a village in the southern part of the Transvaal to be near the fossil beds of the Great Karoo. In the year 1934, when Dr. Broom was in his sixty-eighth year, there came to his village two distinguished South African statesmen—General Smuts and the Hon. J. H. Hofmeyer. They begged him to accept a post in the Transvaal Museum, Pretoria, in order that he might be free to devote his genius to the untrammelled exploitation of his chosen field of study. Dr. Broom gladly accepted their offer.

Long before Dr. Broom went to Pretoria he was interested in discoveries which were being made in a great lime-pit at Taungs, which is situated outside the south-western corner of the Transvaal and within British Bechuanaland. From that pit there came, in 1924, along with many other fossil remains, mostly of a Pleistocene date, a fossil skull which Prof. Raymond Dart, of the Witwatersrand University, Johannesburg, announced¹ to be that of a very young but altogether new kind of anthropoid, much more akin to man than any living or fossil form then known. Dart's announcement was questioned by many of us;² we were of opinion that the fossil anthropoid, to which the discoverer had given the name of *Australopithecus*, would turn out to be, when its adult state was discovered, a member of the family group to which the living African anthropoids belonged—the gorilla and chimpanzee. Dr. Broom took Dr. Dart's point of view and, when he went to Pretoria in 1934, determined to follow the matter up. In 1936 he was rewarded by the discovery of the fossil skull of an anthropoid which at first he believed to be the adult form of that found at Taungs, but later came to the conclusion that it differed so much from that described by Dr. Dart that it deserved a separate generic name—*Plesianthropus*. Then in 1938 fortune again smiled on him; the fossil bones of a third kind of South African anthropoid were discovered. To this third form Dr. Broom gave the name *Paranthropus*. The calcareous deposits which yielded these new forms to Dr. Broom were of the same nature as those at Taungs, but were situated within the Transvaal, near Krugersdorp, some twenty miles to the north-west of Johannesburg. Meantime, on the strength of the evidence which had been accumulating, Dr. Broom believed that the antiquity of the South African anthropoids was greater than had been

originally estimated, that the Taungs form might be mid-Pliocene in date, the others Upper Pliocene or Lower Pleistocene.

In the monograph which has now come to me Dr. Broom assembles the evidence which bears on the nature of the anthropoids which roamed across the veldts of South Africa in prehistoric ages. The evidence is dead against those of us who believed they would prove to be members of the gorilla-chimpanzee group. They differ from all living anthropoids in three important respects: first, their teeth are human; if only the teeth had been found, they would have been accepted as evidence of the existence of man; their canine teeth were not prominent and tusk-like. Second, such fragments of the lower limbs as have been recovered are human in shape; if these only had been found, they would have been accepted as incontrovertible evidence of human existence; the South African apes must have walked as men do. Third, the fossil fragments from their upper limbs were also shaped as in man; the arm and hand no longer served in locomotion as in all living anthropoids, but were free to serve the needs of the body. The anatomical evidence suggests that the South African anthropoids were also human in this respect—their chief means of offence and defence were provided, not by great canines, but by means of improvised weapons wielded by the hand.

Are we, then, to regard these extinct races of South African beings as men or as apes? This is how Dr. Broom sums up the situation: "It seems immaterial where we draw the line, and whether we regard the *Australopithecines* as sub-human or human. What appears certain is that the group, if not quite worthy of being called men, were nearly men, and were certainly closely allied to mankind, and not at all nearly related to the living anthropoids" (p. 142). Dr. Broom is thus of opinion that if we are to give a status to these extinct South African forms, we must place them among men, not among apes. Dr. Broom's junior partner, Dr. Schepers, who deciphered the brain equipment of these extinct forms from casts taken from the interior of their skulls, demands a human status for them in the most positive terms. "The least we can say," writes Dr. Schepers, "is that these fossil types were capable of functioning in the erect posture, of using their hands in a limited sense for skilled movements not associated with progression, of interpreting their immediately visible, pal-

pable and audible environment in such detail and with such discrimination that they had the subject matter for articulate speech well under control, and of having developed motoric centres for the appropriate application; they were also capable of communicating the acquired information to their families, friends, and neighbours, thus establishing one of the first bonds of man's complex social life. With all these attributes they must have been virtually true human beings, no matter how simian their external appearance may have remained" (p. 253). In brief these extinct forms of South Africa were truly human, but were dressed in the garb of anthropoid apes.

The discovery of extinct forms of man-like apes in South Africa brings us face to face with a situation which Darwin had foreseen as he wrote *The Descent of Man*. How are we to distinguish ape from man? As the following passage shows, Darwin was of opinion no line of demarcation could be drawn. "In a series of forms," he wrote, "graduating insensibly from some ape-like creature to man as he now exists, it would be impossible to fix on any definite point when the term 'man' ought to be used."³ There is the same difficulty in deciding when an infant becomes a child, yet it is useful to distinguish the one period from the other. The eruption of the first permanent molar teeth provides a convenient mark for determining the end of infancy and the beginning of childhood. In the chimpanzee the first permanent molar cuts at the end of the third year; in the human infant in the seventh year.

What sign can we use to mark the end of apehood and the beginning of manhood? The essential mark of man lies neither in his teeth, nor in his postural adaptations, but in his brain, the organ of his mentality. How big was the brain when it became capable of sustaining a mentality which may be called human? In search of an answer to this question let us turn first to a primitive race of mankind, the aborigines of Australia. Professor Wood-Jones⁴ found that the brain volume in aboriginal women may be as low as 855 c.c., and as high as 1470 c.c. in men. The mean brain volume for the race is approximately 1200 c.c. The gorilla is the largest-brained of living anthropoids; in females the brain volume may be as low as 390 c.c. and in males as high as 650 c.c.;⁵ the mean for both sexes, 470 c.c. The Rubicon between apehood and manhood, so far as concerns brain volume, lies some-

where between the sum for the highest gorilla (650 c.c.) and the lowest aborigine (855 c.c.). On the strength of such evidence as is available to me at present I would say that the Rubicon lies somewhere between 700 c.c. and 800 c.c.; to be more precise, I would say that any group of the great Primates which has attained a *mean brain volume* of 750 c.c. and over should no longer be regarded as anthropoid, but as human. Let us test such a standard on the earliest men of Java, whose remains have been found in the oldest deposits of the Pleistocene period (see p. 225). The brain volume of one of the Javanese fossils regarded as a female has been estimated at 750 c.c., while that of another, regarded as a male, 950 c.c., the mean for the two being 850 c.c.⁶ These early Pithecanthropi, then, have crossed the Rubicon as regards volume of brain, and all who have made a special study of casts taken from the brain-chambers of their skulls agree that the essential human features of the brain can be detected on them.

Let us now apply this test to the brain volumes of the extinct South African anthropoids. The largest-brained is the form named by Dr. Broom, *Paranthropus*; the individual studied had a brain volume estimated at 650 c.c.; in two individuals of another genus (*Plesianthropus*) the estimated volumes were 435 c.c. and 560 c.c. Let us take the case of the Taungs child; its brain volume is 500 c.c., its first permanent molars are cut, and it has therefore attained eighty per cent of its full size of brain; if it had lived, its brain would have been about 650 c.c. In contrast, let us consider the case of the oldest of the fossil skulls of Java. It is that of an infant about two years of age, and should therefore have attained about seventy per cent of its full size of brain. The brain volume of this infant is 650 c.c.; if it had lived, it should have reached a volume of 845 c.c., thus almost reaching the Australian minimum. In brain volume, then, the extinct South African anthropoids fall short of the Rubicon; they are anthropoids, but of a kind which in structure of body and in form of brain come much nearer to man than do any of the living forms.

I have given details relating to the brain volumes of extinct forms of anthropoids and of men because of a special object I have in view. I want to envisage, in imagination, a social group of these South African anthropoids and to follow it through long æons while the brains of its individual members grew in mass and in organization, until the Rubicon that lies between ape-dom and

man-dom had been crossed. What are the changes in mentality which would have occurred at the crossing? From what we know of living anthropoids, we may infer that the chief mental activities of the group will be three in number—namely, those concerned with mating, maternity, and social behaviour. Each group will be attached to a territory and maintain its isolation. In living anthropoids, as we have seen (Essay XIV), all these activities are under instinctive control; the members of a group followed a policy of which the ends or object were quite unknown to them. The structure of their brains was so organized as to secure the instinctive carrying out of such a policy. We know, however, that even in living anthropoids instinctive control is far from being rigid; they have the power of learning from experience; that power they owe to the extent of their cerebral cortex. We may assume, therefore, that in the more highly-brained group, whose progress we are following, instinctive urges, when they rise within the field of consciousness, may not be given their appropriate responses; these responses may be modified in the light of experience. When our group has safely crossed the mental Rubicon and passed well within the realm of humanity, it has carried with it all the instinctive urges which served on the other side. The sole change lay in this: an increase in mass and in specialization of the cerebral cortex gave a higher degree of control over the inborn urges or impulses. Thus it was, as Darwin had declared, there was no point in the passage from ape to man at which a bystander could have said: here simian mentality ended and there human mentality began. The important fact for the student of human evolution to note is that man brought with him, out of ape-dom, the entire anthropoidal outfit of instincts, but had obtained an increase of cerebral cortex to enable him to control them.

The relationship of intelligence to instinct has been discussed by many authorities. I need cite only a few of their statements. First, there is that of the philosopher-surgeon of the eighteenth century, John Hunter. "Man," he wrote, "has the instinctive principles of every animal, with this difference, that he chooses or varies the mode of putting these principles into action."⁸ Then there is the opinion of a philosopher-physician of the twentieth-century, Wilfred Trotter, which he worded as follows: "Intelligence leaves its possessor no less impelled by instinct than his

simple ancestor, but endows him with the capacity to respond in a larger variety of ways." ⁹ "Intelligence and instinct are inseparable," is the opinion of a modern psychologist, C. S. Myers.¹⁰ Professor Drever holds that "if there is emotion or interest, then there is instinct."¹¹ To these may be added Herbert Spencer's statement that "Memory becomes necessary as instinct becomes intelligence."¹²

The anthropoid ape has no means of treasuring and of transmitting its experience from generation to generation. The mother chimpanzee knows her child but has no name for it; the child knows its mother but has no name for her; each member of a group knows every other but has no names for them; they know the things which are good to eat but these things remain nameless. The facts of birth and of death are beyond their comprehension. Such sounds as they use are expressive of their feelings and moods. When did man begin to be vocal—to apply names to things, and thus become capable of handing on experience? It was when certain cortical areas of his brain underwent extension and specialization, especially changes which affected the frontal lobes of his brain. The circumstances which gave rise to these cerebral additions remain a mystery, but there can be no doubt as to the advantage they gave to the group or groups in which such cerebral additions made their appearance. Dr. Schepers claims to have detected the beginnings of the cerebral basis of speech in the cranial casts of the South African anthropoids. However wrong this may prove to be, there can be no doubt of their presence in the hominids of Java; they were alive at the beginning of the Pleistocene period, which, on our present crude geological scale of reckoning, is given an antiquity of about a million years. How much earlier the brain became an organ fit for speech we cannot tell, but when it did become fit man had indeed crossed the ape-man Rubicon.

The great increase of cerebral cortex in early man was accompanied by certain changes in his mentality. His powers of memory became greatly increased. His field of consciousness became widened and more brightly illuminated. He became capable of discriminating—of comparing in his field of consciousness one thing with another; of detecting wherein they agreed and wherein they differed. Public opinion, which in an anthropoid group is but a rabid exhibition of temper, became in early

man a vocal criticism expressed by significant sounds. What he regarded as good had one vocal sound given to it; what was disliked was given another. Morality became codified.

As the powers of understanding increased in early man, as his tree of knowledge flourished more and more, he became exposed to a grave danger—that of disillusionment. What would have been the fate of a primitive community if its members, as they began to understand the stark realities of life, came to share the opinion expressed by the preacher in Ecclesiastes? "Therefore I hated life; because the work that is wrought under the sun is grievous unto me; for all is vanity and vexation of spirit."¹³ Hume was of opinion that man was kept alive by a prejudice, and this may be accepted as true if we agree that the instinct of self-preservation may be regarded as a prejudice. In the passage from the ape stage to the human stage there was introduced in the instinctive centres of the brain a magical texture which made all connected with life seem not only desirable but beautiful. This was so, not only with the "prejudices" which make us cling to life, but with all the urges connected with sex, with motherhood, and with homeland; all became shot with a new radiance. What the nature of the neural changes which gave the human brain these magical qualities may have been we do not know, but they made him see beauty in what entered his sensorium by the eye, to hear music in what entered by the ear, and turned the drab offices of paternity and of maternity into soul-satisfying ordinances. These marvellous changes belong to the obscure period which marked the rise of man's emotional system. Suffice it to say that as man's faculty of understanding grew so did his power of enhancing all that was felt, seen, and heard.

How am I to fit the fossil anthropoids which were alive in South Africa during the Pliocene and Pleistocene ages into the scheme of human evolution outlined in Essay XVII? These animals, although anthropoidal in appearance and in size of brain, were yet human in their dentition and in carriage of body; their habitual life was no longer led in the trees but on the ground. My scheme assumes that up to the end of the Oligocene period (see p. 158) the great anthropoids (the gorilla, chimpanzee, and orang) and man were represented by a common ancestry, all being strictly arboreal in habit. It was during this stage, my scheme assumes, that the anthropoidal group which was ultimately to

evolve into humanity became separated from the groups which were to remain anthropoids. The limbs and bodies of the common ancestry were then undergoing postural modifications, the lower limbs of the pre-human group or groups becoming more and more the chief means of support in climbing and, at the same time, becoming better fitted to serve as organs of progression on the ground. In the groups destined to remain anthropoid, on the other hand, both upper and lower limbs became more and more adapted for an arboreal life. In the ancestral anthropoid groups the canine teeth became more and more developed as weapons of defence and offence, while in the pre-human group the canines fell into abeyance. My scheme assumes that before the end of the Miocene period the lower limbs of the pre-human groups had become completely adapted for a life on the ground; they were thus no longer confined to a life in the jungle, but were free to roam in the open country and thus to have the whole earth open to them. The South African anthropoids seem to me to represent the stage reached by our human ancestry in the Miocene period. That representatives of this Miocene phase of man's evolution should have survived into the Pleistocene period in South Africa does not seem to me an improbable assumption.

Dr. Broom's scheme of human evolution, and the place of the South African anthropoids in that scheme, differs from that I have just outlined. He holds that man's lineage separated from that of the great anthropoids at a much earlier geological epoch than that postulated by me; he regards the separation as having taken place in the Lower Oligocene period, while the Old World Primates were still at an initial stage of their evolution. Here is a significant passage from his text (p. 142): "And we may regard it as almost certain that man arose from a Pliocene member of the Australopithecines (South African anthropoids), probably very near to *Australopithecus* itself, and that the resemblances between the higher anthropoids and some types of man are merely due to parallel developments and do not indicate any close affinity."

In the most important point Dr. Broom and I are in agreement; of all the fossil forms known to us, the Australopithecines are the nearest akin to man and the most likely to stand in the direct line of man's ascent. We differ in two matters: (1) he places the phase of evolution represented by the Australopithecines in the Pliocene, whereas, for reasons to be unfolded in the next essay,

I think it necessary to attribute it to an older geological period; (2) he attributes the structural resemblances of the Australopithecines to the living anthropoids as due to parallel evolution. I attribute these resemblances to a common inheritance. The points of structure which man shares with the living anthropoids are too numerous and too intimate to be attributed to anything else than an inheritance from a common ancestry.

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THE ANTHROPOIDAL ANCESTORS OF MANKIND SPREAD ABROAD

Synopsis.—The author summarizes the argument developed in the preceding essays and outlines the course it is to take in succeeding essays. Africa is postulated as the centre of dispersal of the anthropoid ancestors of mankind. Darwin's description of a migratory tribe. The spread of the Maoris in New Zealand. Although anthropoid apes and early hominids inhabited ancient China, they failed to reach the New World. Man's late arrival in America. The American Indians cannot be derived from any of the Asiatic peoples now living in the neighbourhood of Bering Strait. Nevertheless, the migratory movements of the Northern Tungus help us to understand how the original settlement in Alaska was made. The original immigrants from Asia to America had a peculiar assortment of blood-genes. How this anomaly may be explained. The author attempts a reconstruction of the dispersal movements which carried the original settlers from Alaska to Tierra del Fuego. Clans and tribes multiplied in numbers; so did forms of speech. Each new clan represented a new assortment of genes. An estimate of the number of "evolutionary units" ultimately formed in America. The anthropological effects produced by the introduction of agriculture. Later arrivals from Asia. Exogamy.

My argument has now reached a point when it is necessary for the sake of the author, as well as for that of the reader, to look back and survey the road along which we have come and again to note the milestones we have passed to reach our present position. It may be convenient, too, at this point to glance forward along the path our footsteps are to follow and mark the heights we hope to attain.

First, then, let us look back and see how far our argument has carried us. Essays I-III were devoted to an exposition of the group theory of human evolution; thereafter we entered on a detailed account of the factors concerned in group evolution.¹ It

may have surprised the reader—it certainly did the author—to find how deeply “human nature” was implicated in the process of group evolution. Essays IV–XIV are concerned with the part played by mentality in group evolution: the attachment of a group to its territory; its consciousness of community; its patriotism or devotion to community affairs; its co-operative and competitive complexes; its prejudices; its resentful and revengeful nature; its continual search for status and power; its loyalties; its morality—all these being manifestations of “human nature.” Essay XIV provided an interlude during which a brief survey was made of the factors which bring about functional and structural changes in man’s body and brain. We found that in bringing about these evolutionary changes three factors were concerned—namely, production, competition, and selection. In the essays which follow XIV such factors as group isolation, inbreeding, mating, marriage, sex differentiation, and sexual selection, which, at first sight, seem to be remote from the influence of human mentality, turn out on closer analysis to be very closely connected with it. Thus our main effort, so far, has been to set up what may be called the machinery of evolution; now we are to study the effects produced by that machinery. Two of the preceding essays, however, have a direct bearing on the steps we are now about to take. In Essay XVII (the contrasted fates of ape and man) a geological scale of time was set up in order that we might be in a position to give approximate dates to the evolutionary events which have to be mentioned and described; in that essay, too, an opportunity was taken to discuss the bearings of genetics on the processes of evolution. Then, in Essay XXI man’s anthropoid ancestor was set on his feet and brought to the mental Rubicon which has to be crossed before the term “human” can be claimed or admitted.

Such is the point in human evolution we have reached. In this essay we have now to follow the pre-human groups as they spread abroad from the centre or centres where they made their first appearance. We shall have to confess that, as yet, we have not the evidence which permits us to trace the spread of these forerunners of man from region to region of the Old World; but we do know that by the end of the Pliocene the status of humanity had been attained and that races of hominids were to be found in all the continental masses of the Old World. Later we shall have

to inquire how each continent came by its own kind of humanity and how these kinds became separated into local varieties. Then we shall have to discuss the rise of the modern races of mankind and the building of nations and empires. Nationalism and racialism will have to come up for discussion, and the bearing which these human passions have on statesmanship and on anthropology. If the theory of human evolution which is being expounded in these pages is well-founded, it should help us to understand how beings which were at first purely simian in nature became ultimately human; it should throw a new light on the problems which perplex the modern world; it should permit us to make a reasoned forecast of what the future has in store for mankind. So much, then, for the programme which lies in front of us.

Meantime, we have to return to the spreading abroad of the ground-living forerunners of mankind, such as are represented by the extinct anthropoids of South Africa. Where are we to pitch the centre of dispersal? The evidence, as it stands to-day, favours Africa. It is in that continent we find the living anthropoids which are most akin to man in structure of body and of brain; it is there, too, that ground forms of anthropoids lived; the oldest and most primitive of orthograde forms lived in the lower valley of the Nile. If we may select one region as more likely than another, then our choice falls on the uplands of Uganda and Kenya; during Upper Miocene times this area was the home of numerous anthropoids, one of which was akin to the gorilla and chimpanzee and yet in certain features more human than either.¹ If the spread was towards the north, the continent of Asia was open to the migrating groups, for at that period there was no Red Sea, Arabia being joined to Africa and India united with Arabia. Northern India, in Upper Miocene times, had a rich fauna of anthropoid apes, and it may have been, as Dr. Davidson Black² maintained, that the spread was from Asia to Africa, and not as I have postulated. Nevertheless, the evidence favours an African source, so, until we know better, I am to regard the uplands of East Africa as a centre for the dispersal of man's anthropoid forerunners. Nor should it be forgotten that at the date of which I write—Upper Miocene—Europe also provided a home for several forms of anthropoid apes. Thus, some ten or twelve million years ago, on the time scale we are using (p. 164), the

great anthropoids had spread throughout the tropical jungles of the Old World.

First, let us turn to passages in which Darwin gives his conception of how the process of dispersal was carried out. His descriptions refer to early humanity, not to the more primitive forms which I have in mind; in all stages of evolution the process of spread is likely to have been similar. Here is Darwin's chief passage :—

“ As it is improbable that the numerous and unimportant points of resemblance between the several races of man in bodily structure and mental faculties should all have been independently acquired, they must have been inherited from progenitors who had these same characters. We thus gain some insight into the early state of man, before he had spread step by step over the face of the earth. The spreading of man to regions widely separated by the sea, no doubt preceded any great divergence of character in the several races; for otherwise we should meet with the same race in distinct continents; and this is never the case.”³

Here Darwin assumes that differentiation into races followed dispersal. In another passage concerned with dispersal Darwin ascribes differentiation into races as a result of sexual selection, whereas modern anthropologists ascribe racial characterization to the action of hormones (see Essay XIX, p. 189). A passage from *The Descent of Man*⁴ reads thus :—

“ Let us suppose the members of a tribe, practising some form of marriage, to spread over an unoccupied continent. They would soon split up into distinct hordes, separated from each other by various barriers, and still more effectually by the incessant wars between all barbarous nations. . . . The hordes would thus be exposed to slightly different conditions and habits of life, and would sooner or later come to differ in some small degree. As soon as this occurred, each isolated tribe would form for itself a slightly different standard of beauty, and then unconscious selection would come into action. . . . Thus the differences between the tribes, at first very slight, would gradually and inevitably be more or less increased.”

An instructive example of the manner in which a primitive people effects dispersal in a new homeland is provided by the traditional history of the Maoris. Somewhere about the fourteenth century A.D. a few boatloads of Maoris reached the North Island of New Zealand, and married with the aborigines, the Moriori, whom they ultimately exterminated or expelled. Here is Elsdon Best's account of their spread :—

“As the northern parts of the North Island became more populated by increasing numbers of the mixed Maori folk, inter-tribal quarrels became frequent, and weak tribes were often compelled to seek new homes elsewhere. The general direction of their movements was southwards, and so, in the course of centuries, many such peoples were pushed southwards to Weirarapa, the Wellington district, and the South Island. As the population increased, so, apparently, did hostile conditions and isolation, for inter-communications between tribes would tend to decrease as dissensions and fighting became more common.”⁵

These pioneering groups of a spreading people formed inbreeding communities, thus permitting a full development of their germinal potentialities.

Although anthropoid apes were living during the Pliocene period in that part of Asia which is now known as China, they never made their way into the New World. More surprising is the fact that the early hominids who inhabited China at the beginning of the Pleistocene period never reached the virgin continent; all authorities are agreed that there is no evidence of the existence of man in the New World until the closing phase of the last glaciation—that is to say, about 10,000 years ago.⁶ Anthropologists agree that the conjoined American continents were populated by one breed of mankind, and that this breed came from the north-eastern part of Asia, and entered their new home by the ice-pack which forms a natural and easy bridge to the north of Bering Strait.⁷ The inhospitable conditions which mark the approach to the Bering Strait on the Asiatic side seem to have repelled all early inhabitants. Even Japan, which is 2,000 miles distant from the Strait, was not inhabited until the Neolithic Age; no trace has been found in it of Palæolithic inhabitants.⁸

The peoples who now live in the north-east corner of Siberia

cannot be regarded as representatives of the ancestral stock which gave birth to the pioneers who settled the New World; all of them have full-blown Mongolian features; in the pioneers these facial traits were still in an incipient stage of development. Although this is the case, yet much concerning movements, migrations, and spread of primitive peoples can be learned from the Tungus tribes who now inhabit the bleak and mountainous country along the upper reaches of the Lena and the lower reaches of the Amur valley. We shall not greatly err if we apply what we learn from the northern Reindeer Tungus to the movements and migrations of the pioneer immigrants. A distinguished Russian anthropologist, Dr. S. M. Shirokogoroff,⁹ made a prolonged and detailed study of the Reindeer Tungus, and this is what he has to say about their migratory habits:—

“The Tungus have migrated ever since the early ages. . . . Clans like the Samagir, Mamugir, Kindigir, and many others under certain circumstances have broken up into two or more territorial and exogamic units. . . . So if the unit is too numerous, it divides into two or more new units; if too small, it joins any other clan. . . . The process of division and absorption of clans is especially intensive during periods of changes and migrations.”

And further it is of particular importance for our present object to note that “in the process of migrations two clans bound by marital exogamous relations usually separate, and the new group may continue to maintain endogamy” (p. 367). Thus a clan on the move is an endogamous, inbreeding, small community, made up of some fifty to a hundred families. “Every clan member is proud of belonging to his clan and is interested in its future success” (p. 189). “The fruit of the hunting does not belong to the hunter but to the clan” (p. 195). Such are the customs and habits of a modern migratory Tungus clan; we shall not be far wrong if we attribute to the group or groups of Palæo-Asiatics who made their way to Alaska and laid the foundation of the entire Amerind population of the New World the habits, customs, and clan organization still retained by the northern Tungus.

In one respect the pioneer immigrants differed from all the peoples who now live in N.E. Asia; all of these are rich in a particular blood group, that known as “B”; whereas this group

is unrepresented in the Amerind population of the New World.¹⁰ Apparently in the germinal outfit of the pioneer group or groups the gene for "B" was absent. Now, the population of Asia is noted for the high proportion of the "B" group and, we infer, always has been. How, then, are we to account for the absence of this blood element in a people which was undoubtedly derived from Asia? I account for it in this way. An inbreeding group or community may differ profoundly in its blood groups from a neighbouring group or community, although both may be members of the same tribe. For example, Dr. Shanklin¹¹ examined various sections of the Rwala tribe of Arabs; in one section he found the "B" group unrepresented, while in another section of the same tribe the "B" and "AB" groups were represented by 14.8 per cent of its members. Dr. Bijlmer¹² found a similar state of matters among adjacent communities in the island of Ceram. I assume, therefore, that the clan or clans of Palæo-Asiatics, who first succeeded in reaching the New World, were inbreeding communities in which there were no bearers of the "B" gene, but only those which carried the "O" or "A" gene; I further make the bold assumption that the whole Amerind population of America, from Bering Strait to the Strait of Magellan, is the progeny of the original pioneer group or groups. Certainly the American Indians differ in appearance from tribe to tribe and from region to region, but underneath these local differences there is a fundamental similarity. This, too, is in favour of descent from a single, small, ancestral community.

The pioneers who broke into Alaska had before them such limitless prospects as had never before fallen to the lot of any human community in the long history of mankind. Before them lay two virgin continents with fifteen million square miles of land, representing one-third of the total inhabitable area of the earth's surface. We may safely assume that the pioneers retained their clan organization; as the original clan became of swollen size, it divided, the daughter clans spreading into new territories. And so the process of dividing and re-dividing went on; there must have been what we may call a "growing edge" of population advancing towards the south, advancing very slowly at first, but ever more rapidly as the number of clans and tribes increased. It took the white settlers two centuries and a half to spread across the United States from east to west, a distance of 3,000 miles. ¶ It

is about 12,500 miles from Bering Strait to that of Magellan. The spread of the white man was fostered and fed by emigration from Europe, whereas that of the Indian was a result of native increase, and would therefore be much slower—say one-fifth of the white rate. At such a pace it would have taken the descendants of the pioneers some 5,000 years to reach Cape Horn.

As daughter communities broke away and became isolated from their parent communities, the parent speech underwent modification after modification, so that by the time Cape Horn was reached thousands of dialects and scores of "families of speech" had come into existence. The more the forms of speech multiplied, the more effectively were the Indian communities isolated from one another. Experts estimate that about 150 different groups of speech have been used and evolved by the native communities of America.¹³ The theory I am upholding assumes that these 150 separate linguistic families have been evolved from the tongue of the original group of pioneers. If this is so, then these tongues, which seem unrelated, must have been united by a host of languages which are now extinct. Speech is infinitely more plastic to the impact of evolution than is the living human body.

In the advance from the north to the south, groups, clans, and tribes must have divided and re-divided a very great number of times, new swarms passing out to form separate communities. Those who have not considered the matter may be of opinion that each new swarm carried away a fair sample of the genes circulating in the parent tribe. This is not so; an inquiry by Dr. G. Morant¹⁴ serves to illustrate the inequality of such division. He tabulated the stature of 700 soldiers recruited in Lanarkshire, taking hundred by hundred in the order of recruitment. Each hundred differed from the other in the distribution of stature and, we may presume, in the hereditary genes which control stature. If each hundred of these recruits had been members of a separate swarming group, then each of the new groups formed would have had its own individuality of stature. And so with every other feature of the body, such as shape of head, form of nose and face, colour of skin and texture of hair.

North and south of the chain of lakes of North America there were evolved large tribes of tallish, finely made, but fierce men with heads varying on each side of the line which separates long

heads from round; such men provided the warriors of the Iroquois, the Algonkins, and Sioux; although of different tribes, these men were much alike in physical appearance. In South America we again meet with the tall type in the pampean plains and also forming a separate community in Brazil, but the predominating type in South America is short in stature, with chocolate tint of skin and, most frequently, round of head.¹⁶ But underneath these differences can be recognized a prevailing similarity, the inheritance from the ancestral pioneer group. As numbers increased, so did tribal competition and tribal selection, and so the rate of evolutionary change became ever more rapid.

As to the number of separate inbreeding communities in existence in America when Columbus made his first voyage (1492), we have only uncertain data. In 1910 Dr. Roland Dixon¹⁷ enumerated 280 tribes in the United States. Five of these were large, ranging between 15,000 and 30,000; forty-two tribes were on the verge of extinction, their representatives numbering ten or less. In Canada ninety-six separate peoples have been enumerated; in Alaska, sixty-six. Thus in recent times there were at least 432 separate breeding units in the six million square miles which form America north of Mexico. The total Indian population of that vast area in pre-Columbian times has been estimated at a little over a million.¹⁸ There would thus be an area of six square miles for every head of the population. Almost all of them were hunting people, dependent for food on the produce of soil, lake, and river. I have found that in most parts of the earth a primitive food-gathering people, as opposed to one which is food-producing, needs about two square miles per head for a comfortable subsistence. Dr. Hinsdale¹⁹ is of opinion that, so far as concerns the Indians of the central lake district of the United States, this is a gross under-estimate. From an examination of the number and size of camps left by former Indian inhabitants of that area he estimated that there were about thirty square miles for each member of the community. An estimate made by Lewis Morgan²⁰ comes nearer to the estimation of two square miles per head. He was of opinion that in pre-Columbian times the State of New York, which contains about 47,000 square miles, never had a population of more than 25,000.

In South America, tribes were smaller and much more numerous. Admiral Markham²¹ made a list of the tribes which live,

or which have lived, in the valley of the Amazon, and found they numbered 455. We shall not err greatly if we put the number of separate "evolutionary units" in the New World in pre-Columbian times at 2,000.

At what point the tribes of Mexico, Central America, and of the Andean Plateau began the practice of agriculture and how they came to invent or to acquire this art are matters which lie outside my purview. But the evolutionary effects of such an innovation in the mode of life cannot be left unconsidered. The introduction of a native agriculture made the sparse tribes of the areas just specified, tribes of squat men, darkish brown in complexion, rounded in head, and roughly visaged, into populous communities. It is estimated that before the arrival of the Spaniards, Aztecs, Mayas, and Incas numbered about twenty millions, perhaps five times the population of the rest of the New World. Agriculture made the short, dark, and round-headed breed the prevalent and the most surely rooted type in the continent. The hoe is a more effective evolutionary instrument than the tomahawk.

There are at least two matters in the brief account I have given of the peopling of the New World with its original inhabitants which need amplification. I have written throughout as if there had been only one settlement and no more. There is ample evidence²² that there have been fresh arrivals from Asia on the north-west coast up to comparatively recent times. The effect produced by such arrivals is of a local nature; the fundamental anthropological unity of the original population remained unchanged. The other point which demands a word of explanation is my use of the term "inbreeding unit." There is a tendency on the part of many to regard exogamy, widely practised in all American Indian tribes, as a form of out-breeding. Exogamy extends only the size of the inbreeding unit. The exogamous tribe is still an inbreeding community.

In this essay we set out to ascertain how the ancestors of man spread from the centre or cradle of their evolution—a centre postulated to have been in Africa—and extended abroad until they became widely disseminated in the Old World. As we have as yet no evidence of the direction nor of the time of the dispersal of pre-hominids, we have been obliged to substitute for them primitive tribes of human beings. The peopling of the New World provided the kind of opportunity of which we were in

search. Hence this essay has been devoted to the elucidation of the original settlement of America. In the next essay we are to find that mankind had become a universal species, and we have to consider how and when it became differentiated into so many breeds or races.

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MAN BECOMES A DENIZEN OF ALL PARTS OF THE WORLD

Synopsis.—In this essay it is assumed that Africa was the birthplace of humanity. Zeuner's chronology of the Pleistocene period. Representatives of Early Pleistocene man. In Java. In North China. In Germany. In England. Weidenreich's solution of the Piltdown conundrum. Rhodesian man—the most primitive form discovered so far in Africa. The assumed spread of man's anthropoid ancestors from Africa into Asia and Europe to become the ancestors of Early Pleistocene man. Modification of the African theory to make it applicable to the case of Piltdown man. The evidence of the wide distribution of mankind at the beginning of the Pleistocene period derived from the stone implements preserved in deposits of that period. The Pleistocene may be described as the "human period"; in it mankind underwent its most rapid phase of evolution.

In the two preceding essays reasons have been given for assuming that somewhere in Africa, most probably in the uplands of East Africa, an anthropoid had become human in body, in hands, in feet, and in gait, but in brain and in face still remained anthropoid. Reason was also given for believing that this stage in human evolution was reached at the dawn of the Pliocene period of the earth's history, a period which on the time scale I am following (p. 164) had a duration of some seven million years. It is also assumed that at this juncture of human evolution the human-footed breed of anthropoids, although broken up into a number of groups or communities, were still confined to the area of their evolution.

It should now be my task to follow our anthropoid ancestors into the long Pliocene period, and to note the rise of their brain and their spread into the adjacent continents of the Old World. Alas! in this year of grace—1947—the anthropologist has to con-

fess that, for him, the Pliocene is his darkest of ages; so far, not a fossil trace of Pliocene man has been found. Yet that such things did happen during the Pliocene Age we have the most complete assurance, for at the close of that age and at the beginning of the next, or Pleistocene, there is the definite evidence of the existence of primitive humanity in parts of the Old World so far apart as Java in the East, England in the West, China in the North, and the farthest point of Africa in the South. The evidence provided by the oldest Pleistocene deposits assures me that man had crossed the mental Rubicon which separates him from the ape and had become the maker of tools and an inhabitant of all the continents of the Old World.

In the broad scale of geological time a million of years has been allotted to the last phase of the earth's history, the Pleistocene. Seeing that the events which have determined the form and distribution of humanity as seen in the modern world were enacted during the Pleistocene Age, it is imperative that we have some form of time-scale which will permit us to trace the sequence of these events. Fortunately for us there can be discerned in the geological deposits laid down during the Pleistocene Age four cycles of climatic change, each cycle, so far as Europe is concerned, beginning with a cold or glacial period and ending in a mild or interglacial phase. In tropical lands each cycle began with a wet or pluvial period passing into a dry or arid phase. Dr. F. E. Zeuner¹ has made a close study of the evidence relating to the duration of these cycles; the chronology adopted here is based on dates given by him. We shall work our way backwards into the Pleistocene, beginning from the present. We are living in the mild period of the fourth cycle, and to this mild space a duration of 18,000 years is assigned. To the preceding cold or glacial phase of the fourth cycle a duration of 94,000 years has been given, the total length of the fourth cycle being thus 112,000 years. The term *Würm* is given to the glaciation of this cycle; here we shall use the term "*Würmian*" to cover the duration of the whole cycle. We shall speak of the deposits laid down during the *Würmian* cycle as those of the "*Upper Pleistocene*." It was early in the *Würmian* cycle that the ancient Neanderthal population of Europe was replaced by men of the Caucasian or modern type.

Pushing our way up the stream of time we enter the third

cycle; to this a duration of 114,000 years has been given, taking us to a date some 226,000 years from the present. The glaciation of this cycle is usually named *Riss*, and we shall use the adjective "Rissian" to cover both cold and mild phases of the cycle. The preceding, or second, cycle was of long duration, the sum allowed being 246,000 years. It thus covers a longer period than the third or fourth cycles put together. The cold phase (*Mindel* glaciation) of the second cycle was short, its mild phase being very long. To reach the beginning of the first Pleistocene cycle, which opened with the *Günz* glaciation, we have to go back more than half a million years (586,000 on the Zeuner scale). This cycle had a duration of 114,000 years, being thus of about the same length of time as the third and fourth cycles. Behind and beyond the first, or *Günzian*, cycle lies a vague hinterland of the Pleistocene period where the Pleistocene fades into the preceding period, that of the Pliocene. To this pre-*Günzian* hinterland of the Pleistocene must be ascribed a duration of over 400,000 years if we are to give this geological period the round sum of one million years.

When we come to deal with the geological deposits which have yielded the fossil bones of early man, certain terms will crop up which I must touch on now. There is the term "Lower Pleistocene"; this I shall apply to the deposits or strata laid down in the pre-*Günzian* interval and during the first, or *Günzian*, cycle. For those laid down during the second and third cycles I shall use the term "Middle Pleistocene," while, as already mentioned, the term "Upper Pleistocene" will be applied to deposits laid down during the cold phase of the fourth cycle.

Having outlined the scale of time we are to apply to the events of the last geological phase of the earth's history, let us take a bird's-eye view of the forms of humanity which were in existence during the first half of the Pleistocene—that is, down to the end of the first cycle (*Günzian*). Our opening glance takes us to the Far East, to the island of Java, which in Pliocene and early Pleistocene times was joined to the mainland of Asia. Here, during the years 1891-3, at Trinil, near the centre of the island, the first example of early Pleistocene man was uncovered by my friend Eugene Dubois. He was born in Holland in 1858 and was trained as an anatomist, but, believing that the mystery of the "missing link" could be solved in Java, joined the Netherland

East India Army as a surgeon in order that he might have opportunities of exploiting his conviction. As we have seen, he proved that his conviction was justified. Dubois was of opinion that the deposits at Trinil that yielded him a fossil skull-cap, and a thigh bone which was manifestly human, had been laid down late in the Pliocene period, but subsequent investigations have proved that they are later than he thought, being now assigned to the closing phase of the first Pleistocene cycle.² Dubois regarded the fossil being he had found at Trinil as neither man nor ape, but as an intermediate creature which shared the characters of both; hence he named it *Pithecanthropus*—the ape-man.³ Certainly the skull-cap did look like that of a great ape; it was low-browed, flat roofed, with great projecting eyebrow ridges. But when the cement-like material which filled its cavity was cleared out and a cast taken of the brain chamber, it was found that *Pithecanthropus* had a brain which was organized on a human pattern and had a volume of 935 c.c., thus falling within the lower limits of the human range. Until 1938 the fossil skull found by Dubois remained a unique specimen, but in that year, from the same geological horizon of Java, von Koenigswald added a second, identical in all points with the original, save that it was more complete and smaller, the brain space measuring only 775 c.c. The second skull is regarded as that of a female; in size of brain she was just across the Rubicon, which it will be remembered was set at 750 c.c. At the time of writing (1946), four skulls and parts of four mandibles have been found, all attributable to the Trinil race of Java.⁴ Although this people were ape-browed and small-brained, yet their teeth were human, their canines scarcely rising above the level of neighbouring teeth.

In the eastern extremity of Java, at Modjokerto, there are deposits which are older than those at Trinil, having been laid down at the very beginning of the Pleistocene period. In 1936 von Koenigswald unearthed the fossil skull of an infant with such markings as lead experts to attribute it to the Trinil race. Its brain volume is estimated at 650 c.c.; if the child had lived we expect that its brain would have attained the Trinil level—namely, between 800 and 900 c.c. Thus we have evidence that in Java, at the very beginning of the Pleistocene period, there existed a race of beings who were human in carriage of body, human in dentition, with brains which fell just within the lowest human

level, yet in their skulls had many resemblances to African anthropoids. We shall see, in a later part of this essay, that traces of even more primitive beings have been found in the older Pleistocene deposits of Java—beings whose characters are reminiscent of the South African anthropoids.

From Java we are now to proceed to North China, involving a journey of over 3,000 miles; there we are to pass in brief review a community of human beings, the Pleistocene contemporaries of the Trinil breed of Java. The scene of discovery takes us to the village of Choukoutien, situated in hilly country some thirty-seven miles to the south-west of Peking. Near the village is a small limestone hill which has proved to be a Pleistocene mausoleum. During the first half of this period its caves and fissures had become filled up, and, as they filled bones of the men and animals inhabiting the adjacent area became cemented in, and thus preserved. Excavation of the hill began in 1926, and by 1940, when war brought excavations to an end, parts of thirty-eight human individuals had been found and examined.⁵ Only five of the skulls were sufficiently complete to provide exact measurements. We turn at once to what these can tell us of the cerebral outfit of this Peking breed or race of Pleistocene humanity. The smallest of the five has a capacity of 915 c.c.; the largest 1,225 c.c.; the mean of the five being 1,070 c.c. They were thus considerably larger brained than the Trinil breed. Because of this increase of brain, the Peking men had skulls with higher vaults, less receding foreheads, but they still retained the supraorbital torus of the African anthropoids; teeth and jaws were robust, but the rudiment of a true human chin had made its appearance. Although the Peking breed had advanced a degree nearer to modern man than the Trinil race, yet, as there are so many points in common between the two, we must infer both had sprung from the same ancestry at no very remote date. The chief point to note is that an early Pleistocene people living in the temperate climate of North China had made an evolutionary advance on their contemporaries living in the tropical climate of Java.

Having noted the evolutionary stage reached by mankind along the eastern lands of the Old World during the earlier phases of the Pleistocene period, we now set out in search of their contemporaries in lands of the extreme West. So far as Europe is concerned only two sites have yielded fossil remains of people who can be regarded



as contemporary with the Trinil and Peking breeds. These sites are at Heidelberg in Germany and at Piltdown in the south of England. At Heidelberg⁶ a complete lower jaw was found; the gravel deposit in which it lay has been accurately dated; it was deposited towards the end of cycle 1—that is, during the Günz-Mindel interglacial; Zeuner gives it an antiquity of about 500,000 years. The Heidelberg mandible is of a type which, in discoveries made in Europe of a later date, has always been found associated with a skull of the Neanderthal form, implying that Heidelberg man had a prominent supraorbital torus and pent forehead, thus resembling the African anthropoids. There are reasons for believing that the anthropoid-browed type extended right across the Old World from China to Germany during the first half of the Pleistocene period.

The gravel deposit at Piltdown in Sussex, in which the fossil fragments of the skull and mandible of a human being were preserved, is less well dated than that in which the Heidelberg jaw lay. This, however, may be affirmed: that Piltdown man was at least a contemporary of Heidelberg man; more likely he was of greater antiquity. The English representative of ancient man differed altogether from the types we have been examining in Java and China. His forehead was like that of the orang, devoid of a supraorbital torus; in its modelling his frontal bone presented many points of resemblance to that of the orang of Borneo and Sumatra. Indeed, experts have attributed the Piltdown mandible to an extinct form of orang; others to a form of chimpanzee which had made its home in the weald of Sussex during Pleistocene times.⁷ It is quite true that the teeth do present a mixture of human and anthropoid features; in degree of development the canine tooth rivalled that of the female chimpanzee. The skull of Piltdown man, although thick-walled and massive, yet in its general structure conforms to the type met with in modern races of mankind;⁸ for instance, the mastoid processes, to which the muscles of the neck are attached, were such as are found in the most evolved of modern mankind. In size of brain he had reached a modern level; the cerebral volume was not less than 1,350 c.c.

The discovery of Eoanthropus, or Piltdown, man (1911-13) presented students of human evolution with a conundrum. How are we to account for this unique type of early Pleistocene man in England while the rest of Europe, and apparently the whole of

Asia, were inhabited by variants of the pent-browed type? If we could get rid of the Piltdown fossil fragments, then we should greatly simplify the problem of human evolution. We should have to account for the evolution of the pent-browed type only, and the development of modern races from that type. A leading authority on such problems, Dr. Franz Weidenreich, has recently proposed⁹ that the right solution is to deny the authenticity of the Piltdown fossil remains. Here are his exact words: "Eoanthropus should be erased from the list of human fossils. It is the artificial combination of fragments of a modern-human braincase with orang-utang-like mandible and teeth." That is one way of getting rid of facts which do not fit into a preconceived theory; the usual way pursued by men of science is, not to get rid of facts, but frame theory to fit them. That is what I propose to do. It is important to remember, in connection with the Piltdown problem, that in Pliocene and early Pleistocene times England, like Java, was joined to adjacent continental lands, and so might provide a refuge for early, aberrant continental types. If we are convinced that evolution is the true method of creation and that man and anthropoid have been evolved from a common ancestry, what is more probable than that we should find early human forms in which anthropoid and human features are combined?

Having made a running commentary on the early Pleistocene inhabitants of the Old World from Java in the east to England in the west, we return to Africa to see what that continent has to tell us of their contemporaries. So far not a complete bone of an African of the early Pleistocene age has been found;¹⁰ only their stone tools. The oldest of the African races so far discovered is that represented by Rhodesian man.¹¹ His skull and skeleton were exposed deep in a limestone quarry in North Rhodesia in 1921; the fossil bones of animals found with him represent, for the greater part, living species. Such evidence as there is points to his existence late in Middle Pleistocene times. In several respects the skull of Rhodesian man is the most primitive of human forms known to us. It is provided with the most enormous supra-orbital torus ever seen in any skull, anthropoid or human. Like the gorilla, Rhodesian man was long- and heavy-faced; indeed, in several of his facial features he resembled the gorilla. His upper jaw is particularly massive, and no doubt the lower jaw, which is missing, was equally so. The volume of his brain was a

little over 1,300 c.c., thus falling short of that of Piltdown, but exceeding that of the largest-headed of the men of Peking.

Let us now return to the theory adumbrated in an opening passage of this essay (p. 223)—viz., that the centre of evolution of our anthropoid ancestry was in Africa, that by the beginning of the Pliocene period a stage had been reached equivalent to that represented by the extinct races of anthropoid apes of South Africa. From this African centre the anthropoid-headed, human-footed ancestors of the human family began to spread outwards into neighbouring regions. They were certainly social animals, divided into many separate groups or communities. Some of these communities, we may assume, prospered and multiplied in numbers, and this led, as virgin territories were entered, to division and re-division of their small societies. We may feel assured that some communities, in their struggle for a living, went to the wall and were replaced by groups with a better outfit for the new form of life. And so groups slowly changed and evolved as they extended their distribution. No doubt there were "stay-at-home" groups who preferred to remain in the territories they knew, while others, more enterprising and adventurous, pushed past in search of new homes. Probably the "advancing front" moved at a snail's pace compared with the rapid expansion which marked, as we have seen (p. 219), the settlement of the New World, but our Pliocene time-scale—one which allows seven million years—provides more than a sufficiency of time for our scattering communities to reach the most distant parts of the Old World, before the dawn of the Pleistocene Age.

A time came when these African forerunners of humanity reached the confines of Asia. In Pliocene times there was an easy access to that continent from Africa; there was no Red Sea, no Persian Gulf; Arabia was watered and wooded. As our forerunners moved towards the north, some groups, we may suppose, moved westwards into Asia Minor, where they would find a landbridge leading on to Greece and providing access to Central and Western Europe. Other groups may have passed into Central Asia, but the pioneers which hold our immediate interest are those who turned their faces towards India and ultimately reached Java and North China, where, according to this theory of the African origin of humanity, they became the ancestors of the Pithecanthropus and Sinanthropus of the early Pleistocene of these lands.



To the anatomist, the conversion of a South African type of anthropoid into the primitive forms of humanity found in Java and in China seems a feasible proposition. Such a transformation implies merely an increase in the organization and in the size of the brain, with a reduction in strength of jaw and teeth. There is additional evidence in favour of the theory I have outlined. In 1945 Dr. Weidenreich ■ reported that fragments of excessively large jaws and teeth, stamped with humanoid features, had been found in early Pleistocene deposits of both Java and southern China. These fossil fragments have much in common with the corresponding parts of South African anthropoids.

We now return to Africa to apply our theory to one of its own products—Rhodesian man. Of all forms of extinct anthropoids known to us those of South Africa serve best as his probable ancestor. It does not seem too much to suppose that in the course of some six million years or more the brain of an anthropoid should increase in size from 650 c.c. to 1,300 c.c.—the volume of the Rhodesian brain. Such a rate of evolution could not be described as rapid. In the case of the female *Pithecanthropus* of Java the rate was even less, for her brain had a volume of only 775 c.c. In his teeth and jaws Rhodesian man may well be the descendant of *Paranthropus*, a South African anthropoid discovered and described by Dr. Robert Broom.¹³

The African theory, as just outlined, accounts very well for the pent-browed early types of humanity, but leaves unexplained such an aberrant type as that of Piltdown. To account for Piltdown man our theory must be modified in the following respects. So far it has been assumed that the pioneer groups were made up of individuals conforming to one type—namely, that of the South African anthropoids. This may not have been the case—there may have been more than one type. Seeing the close relationship of the orang to the African chimpanzee and gorilla, it is probable that this anthropoid, too, is of African origin. If this were the case, then it is possible that among the early forerunners of mankind in Africa some had inherited the orang form of skull and forehead. This is what I am assuming. This modification of my theory involves two other assumptions:—(1) that it was the orangoid forms that turned westwards into Europe and ultimately reached England, where their further evolution continued; (2) that those characters of the human skull we count modern,

such as the mastoid process and chin, have been evolved independently in several early races of mankind.

There is one important source of evidence bearing on the universality of mankind at the beginning of the Pleistocene period on which I have not touched—namely, the evidence of his tools. The Pleistocene deposits of Africa, of Asia, and of Europe, from the oldest to the most recent, carry the stone tools which man fashioned at the time these deposits were laid down. Indeed, there is good evidence that tool-makers were alive in England long before the dawn of the Pleistocene. My friend the late James Reid Moir (1879-1944) convinced most experts that stone implements of several types, which he found under deposits of late Pliocene date, had been shaped by human hands.¹⁴ At Rabat, in Western Morocco, the Abbé Breuil found stone tools in the very oldest of Pleistocene deposits.¹⁵ In and under the early Pleistocene on the eastern shores of Lake Victoria, at Kanam, were found tools shaped out of pebbles and also a fossil fragment of a human mandible.¹⁶ A map showing the distribution of stone industries in earlier Pleistocene times, such as that prepared by Dr. T. T. Paterson,¹⁷ shows a trail of this pebble culture from South Africa to Java. On many occasions Dr. L. S. B. Leakey has claimed that Africa led the way in the development of stone cultures.¹⁸

Although man crossed the mental Rubicon which separates ape from man in late Pliocene times, yet his real period of evolution was in the Pleistocene. We may well speak of this period as that of the "human age." It is the age of human evolution. Even when we allow a million years to the "human age," we must count the rate of man's evolution during this age as very rapid.

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THE FIVE MAJOR DIVISIONS OF MANKIND

Synopsis.—For the sake of brevity the author proposes to name the *Australopithecinae*, "Dartians." The application of the "African" Theory to explain the distribution of the races of mankind. For this purpose a survey of their distribution is made in the essay. The population of the Old World is separated by "the great Divide" into a pigmented southern zone and a less-pigmented northern zone. The northern zone is divided into *Caucasia* and *Sinasia*; the southern zone into *Africa*, *Indo-Asia*, and *Australia*—each of these five divisions being inhabited by a distinctive stock of humanity. The racial characters of *Caucasia*. The *Europinoids* of *Sinasia*. *Proto-Mongols*. The *Mongolian facies* is of recent evolution. The racial characters of *Sinasia*. The *Ainus*. The triple division of the southern, or pigmented, zone. The racial features of *Africans*. The facial features of the typical *Negro* are of recent origin. Tribal organization prevails throughout native *Africa*. The former existence of pigmented peoples in *Arabia* and in *Irania*. The racial features of the peoples of *India*. The *Indonesians* of *Malayasia*. The *Andamanese*. *Australasia* and the racial characters of its native peoples. The theory of group evolution serves to explain the regional distribution of human races.

IN the preceding essay I felt the lack of a suitable name for the human-footed, ground-living anthropoids which we had reason to believe were evolved in *Africa* and, spreading into the other continents of the Old World, had given rise to the various known forms of early *Pleistocene* humanity. Seeing that Professor *Raymond Dart*¹ was not only the first to describe this form of anthropoid, but boldly recognized it as representative of a stage in human evolution (the role to which I have assigned it in the preceding essay), we may well name all erect, ground-living forms of anthropoids "Dartians" instead of *Australopithecinae*, the name he gave them. At least by doing so we shall gain in brevity of

expression. In this essay we are to fly at much higher game than in the last; there we applied the African theory to explain the origin of the fossil forms of early man, but here we are to apply this same theory to account for the distribution of the living races of mankind, for I am convinced that it is only when we assume that Africa was the evolutionary cradle of early humanity that we find it possible to give an acceptable explanation of the racial distribution in the modern world.

Before we can apply the African theory we must first make a survey of the population of the Old World. To this purpose the present essay is devoted. Although I shall deal with areas and populations as they now are, it will be necessary, from time to time, to hark back to their condition in the Old World of primal times, when men were separated into small groups and lived off the produce of their untilled territories. Primal times, as we saw in Essay III, came to an end with the discovery of agriculture, an event which is usually ascribed to the eighth millennium B.C.

We are concerned here with the main racial "divides" of the Old World, for, as we saw in Essay XXII, the spread of mankind to the New World is a comparatively late event. The great racial divide of the Old World, beginning on the Atlantic coast, follows the northern fringe of the Sahara and is continued eastwards across Arabia until the western end of the Himalayan chain is reached. The divide then follows the line of the Himalayas, crossing Burma and China, to end at the northern extremity of the Philippine Archipelago. All the peoples to the south of the divide are now, or were in primal times, pigmented to a greater or lesser degree, their skins varying from a light brown to a sooty black. To the north of the great divide peoples have skins of a lighter hue, varying from a yellowish-grey to one which is almost devoid of pigment. The great divide, as I have just drawn it, has been bent southwards both to the east and to the west of the Himalayan range. To the east, people of the Mongolian type have pressed southwards, and now occupy the Malayan Archipelago; to the west, peoples from the north have passed into India, Persia, and Arabia, but there is evidence, to be touched on later in this essay, that Africa and New Guinea in primal times were joined by a continuous pigmented zone which crossed Arabia, India, and the lands of the Far East.

We must now pass in brief review the main varieties or racial

subdivisions of mankind, beginning with those which lie to the north of the great divide. A line drawn from the western end of the Himalayan range to the home of the Lapps in Northern Europe divides the northern hemisphere into two great regions. The region to the east and north of this line we shall name Sinasia, Sin being the ancient name of China; Sinasia is inhabited by peoples who conform more or less closely to the Mongolian type. The region lying to the west and south of the dividing line we shall name Caucasia, this region being the home of peoples usually described as "whites," or Caucasians. Europe, measuring 3·8 million square miles, makes up the greater part of this region; Caucasia is completed by the addition of that part of Africa which lies to the north of the Sahara and that part of Asia which lies between the Mediterranean and the Pamir plateau at the western end of the Himalayas, additions which give the homeland of the Caucasians a total area of about six million square miles. The population of the area is estimated to be (1946) about 600 millions, of whom 530 are resident in Europe. The Caucasians resemble one another in their hairiness, the relative paleness of their complexions, and in their facial features, in which the nose plays a characteristic part. Pigmentation decreases as we pass from Africa towards the Baltic; the Caucasians who live farthest from Africa are the fairer in colouring, but even in the pigmented south, among the Berbers of North Africa and among the Kurds of Asia Minor, there are islands of fairness. Heads may be long, round, or of an intermediate form. In Europe the inhabitants are grouped into competitive evolutionary units known as nations, but in large areas of African and Asiatic Caucasia the tribal unit still prevails. For instance, Mark Sykes² found the Kurds divided into over three hundred tribes; Prichard³ enumerates seventy-three tribes of Ilyats in Persia, while in the North-West Frontier zone of India there are more than a score of tribal peoples.

We now turn to a consideration of the eastern ethnic region, Sinasia, the home of peoples with a Mongolic cast of countenance—a cast which is easier of recognition than of measurement. Its area is much larger than that of Caucasia, measuring about eleven million square miles, but is in large part thinly populated—the total number of its inhabitants being about 530 millions. In this total are not included some 120 millions of the Mongoloid stock who have passed south of the great divide and occupied Indo-

China and the islands of the Malayan Archipelago. These will come up for consideration when the southern ethnic hemisphere is dealt with. As to Sinasia proper, China, with its estimated population of 400 millions, provides its chief nucleus. Indeed, we may say that China, which is a huge aggregation of village communities rather than a nation, stands to the rest of Sinasia much as Europe stands to the rest of Caucasia. Outside China the majority of Sinasians are organized in local groups, clans, or tribes. Between the Pamir on the west and southern China on the east Keane⁴ collected evidence of the existence of about one thousand separate local communities. Tibet is still tribal for the greater part; at one time the Mongols were divided into 226 clans or "banners"; the Manchus were divided into sixty tribes, the Buriats into forty-six. In the whole of Sinasia there is but one people, the Japanese, organized and moved by the national competitive spirit which animates most of the peoples of Europe.

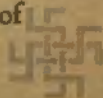
Before enumerating the points which distinguish Sinasians from Caucasians and the darker peoples of the southern zone, I think it well to make a preliminary assumption. I assume that the fully developed Mongolian countenance is an evolutionary event which, in a geological sense, is of recent date; that down to late Pleistocene times the facial features of the primitive inhabitants of Sinasia had many points of resemblance to those of the Caucasians. This assumption is supported by observations made on peoples living along the 3,000-mile frontier line which separates Sinasia from Caucasia. Along the frontier are many tribes which, although akin to the Mongols in speech, differ from them in having Caucasoid features. The Yakuts of the Lena valley are such a people; so are the pastoral tribesmen of western Tibet; the Turks came into being in this frontier zone. We may speak of people of Sinasia who have the Caucasoid type of countenance as Proto-Mongols. The tribes of N.E. Siberia which effected settlements in the New World were Proto-Mongols; so apparently were the late Pleistocene cavemen of Choukoutien of North China.⁵ In Manchuria, in China, and in the upland valleys of Tibet, Burma, Siam, and Tonquin there are sporadic occurrences of individuals described as "Euro-pinoids"—people with Caucasoid features, and of a paler tint than is usual among true Mongols. If we accept the assumption that the earlier inhabitants of Sinasia had Caucasoid facial features,

then we may regard "Europinoids" as individuals who have retained ancestral traits and assume that western Turkish tribes have preserved the Proto-Mongol type. The explanation usually given of the occurrence of Europinoids in Sinasia is that at an early date this ethnical region was "penetrated" by inroads from Caucasias. Such penetrations on a small scale there may have been, but if during the long Pleistocene period there had been a free intermingling of the peoples of Asia with those of Europe and vice versa, then there should have been, not a solid mass of one type in Caucasias and of another type in Sinasia, but a uniform hybrid type extending from Japan in the east to Ireland in the west. We must assume, then, that the Caucasian and Mongolian stocks have been evolved in the region where they are now found, but that both have a common ancestry.

The natives of Sinasia are characterized by their facial features and by certain other traits. The hair of their heads is straight, stiff, long, and black; their bodies are almost hairless; beards, if grown, are sparsely haired. The people of one area, the Ainus, have retained not only the Proto-Mongolian facial features, but have developed hair to the extent usually found in Europeans. The most feasible explanation of the hairiness of the Ainus is to regard it as a gene mutation, which occurred in people of the true Mongolian stock, or due to the survival of ancestral genes. The skin of the natives of Sinasia, varying in colour from that of brown leather to that of chamois leather, is uniformly more deeply pigmented than that of the Caucasians. The Chukchi of N.E. Siberia are said to be "of fair complexion" with a "coppery-coloured" skin, and some of the Samoyed tribes of the far north-west are described as "blond," yet it cannot be said of Sinasia as of Caucasias that the farther from Africa the lighter the degree of pigmentation, for the Sinasians of the Arctic north are as dark as those of the extreme south. But this is true: the farther from Africa the more emphasized does the Mongolian cast of countenance become. The Sinasians differ from the Caucasians in the relative proportions of their blood groups. In Western Europe the proportion of the "A" group is high, that of the "B" group is low. In Eastern Asia it is the opposite; the proportion of "A" group is relatively low while that of the "B" group is relatively high. There is evidence that the "B" factor or gene has extended its distribution from Asia into Eastern Europe.

Having separated the lesser pigmented peoples of the northern hemisphere into two main divisions, we are now to give our attention to the more deeply pigmented peoples of the southern hemisphere of the Old World. We are to divide the southern zone into three main areas, each of which carries its own variety of humanity. The three main divisions of the South are:— (1) Africa, with its 125 millions of Negroid inhabitants; (2) Indo-Asia, which includes that part of Asia which lies to the south of the Himalayan range and extends from the Red Sea in the west to the Moluccas Passage in the east, thus taking in all the Malayan Islands which were joined to the mainland of Asia in earliest Pleistocene times; and (3) Australasia, which embraces Australia, New Guinea, and the chain of Melanesian Islands. The Australasians are the aborigines of these lands.

Seeing the important role which I believe Africa to have played in the evolution of early humanity, it is necessary that we consider in some detail the dimensions of this continent and the physical characters of the peoples who now inhabit it. The majority of its peoples are deeply pigmented, their skin being black or of a deep-chocolate brown. While the Dinkas of the Nile Valley may be described as black, the not-distant tribes on the Welle, the Mombuttu and Zandeh, have skins of a ruddy brown. The Bushmen and Hottentots of the extreme south have skins of a light brown or brownish-yellow tint, reminiscent of the degree of pigmentation found among Mongolian peoples. The natives of West Africa are more heavily pigmented than those of East Africa. All natives of the continent south of the Sahara—for that is the part of Africa with which we are dealing—have black "woolly" hair; only in the peoples of the north-east region, the home of the Hamitic Negroes, does it become frizzled and mop-like. The Hamitic Africans have their facial features modelled on Caucasian lines, their noses being relatively narrow and straight and their jaws not unduly prominent. In the population throughout the rest of the continent we meet with peoples who have assumed, in varying degrees, the facial features of the typical Negro. Noses are wide, and flattened on the face; the lips are full and everted. We must regard the facial features of the full Negro, like those of the evolved Mongol, as something new, something which came into being in Pleistocene times. Two fossil, but imperfect, human skulls found by Dr. Leakey in mid-Pleistocene deposits on the eastern shore of



Lake Victoria certainly foreshadow the facial features of the true Negro; so far this is the earliest record of the existence of the primitive Negro. As regards cranial capacity, which may be accepted as an index of brain volume, the measurement which prevails in Africa is about 100 c.c. less than is met with in Caucasia and Sinasia.

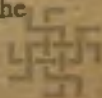
The area of Africa is 11.5 million square miles, but for our present purpose we must deduct from this the Mediterranean zone which has been added to Caucasia and also the whole of the Sahara, so that the habitable area that remains for native Africans is only a little over eight million square miles. In a large part of this area the climate is tropical and much of the country is thickly forested. In the 125 million inhabitants of this area we find social units at all stages of evolution, from small local groups, as among the Bushmen, to multi-tribal kingdoms, such as that of the Baganda in East Africa and that of Bushongo in the lower Congo. The majority of the population, however, is grouped, or was so until Africa passed under the control of European Powers, in tribal societies of varying sizes, each society occupying a separate or independent territory. In the Belgian Congo Hambly⁶ enumerates 117 tribes, in Uganda sixty-one. The number of tribes given for Tanganyika⁷ is 117. Keane⁸ enumerates 110 peoples in the Bantu-speaking area; in the Soudan, which crosses Africa from west to east, south of the Sahara, he gives a list of 108 peoples. Many of these Soudanese peoples have borrowed genes, as well as culture, from Arabia. In the seventeenth century B.C. Egyptians found the Berberines living above the first cataract divided into 113 tribes. But nowhere in native Africa has a group of tribes been welded together so closely as to form a national unit. Only in Egypt has this evolutionary stage been revealed, and, after some hesitation, I have assigned Egypt to Caucasia.

We now pass to a consideration of the middle zone or division of the "Pigmented South"—Indo-Asia, of which India with its 400 million inhabitants is the sole intact and surviving part. The lands which lie between N.E. Africa and India are now occupied by peoples of the Caucasian type, but there are reasons for believing that in primal times the pigmented belt swept on unbroken from west to east. Many of the Himyaritic tribes and peoples of South Arabia are deeply pigmented, with a strong resemblance to the Somali of N.E. Africa. The natives of Persian Arabistan

are noted for the darkness of their complexion; the Brahuists of Baluchistan speak a language allied to the tongues of Dravidian India. But the chief circumstance which leads an anthropologist to assume a former continuity of the peoples of Africa with those of India is the degree of resemblance he finds between the Hamitic peoples of Africa and the Dravidian inhabitants of southern India. Here is Keane's description of typical Dravidians: "The stature is short, the complexion very dark, almost black, hair plentiful with a tendency to curl, head long, and nose very broad."⁹ I would modify this description by saying that although "broad noses" are to be seen among Dravidians, yet the prevailing type is narrow and straight, and the features of the face, like those of the Hamites, are regular and Caucasoid. Among Indian hill tribes we meet individuals with the woolly hair and thick lips of the African, but these are only interesting exceptions; most Dravidians have hair that is wavy or straight, and always black. The Dravidian body, like that of the Hamite, is almost devoid of hair and the face is usually beardless. In India, as in Africa, there are areas occupied by short- or round-headed folk,¹⁰ yet in both countries long-headedness is the type which prevails. As regards volume of brain, Indians and Africans are on an equality; their mean cranial capacity is about 100 c.c. less than holds for Caucasians and Sinasians.¹¹ In spite of invasions and penetrations from the north-west, India still remains part of the pigmented zone; so far as concerns colour of skin these invasions have served merely to lessen the depth of pigmentation among the more northerly peoples.

The inhabitants of India, like those of Africa, have retained a tribal organization. Within its area of 1.7 million square miles there are over 600 principalities, large and small, but in none of them, either now or in former times, was that degree of cohesion reached which entitled them to be described as national units. Millions of Indians are still grouped in primitive tribal units. The vast majority of Hindus are organized into social units known as castes; there are over 3,000 of them. Castes represent evolutionary units of a peaceful disposition.¹²

Beyond India, on its eastern side, is an area almost equal to that of India itself, which may be named the "submerged region" of the middle pigmented zone. It includes Indo-China, the Malay Peninsula, the Malayan Archipelago, and the Philippines. The



inhabitants of all these lands, numbering some 120 millions, have the Mongolian faces developed to a greater or lesser degree, but ethnologists have long recognized that in the present population there are traces of an older one. The Andaman Islands, situated between India and Indo-China, have preserved a sample of this ancient stock. The Andamanese are exceptionally short of stature, with deeply pigmented skins, and woolly black hair, but their nose is not flattened nor are their lips unduly thick. Peoples with similar Negroid features and of short stature are found in the Malay Peninsula and in the Philippines. Besides these aberrant peoples there are found throughout this wide region tribes of ordinary stature, with facial features which may be described as Caucasoid, with skins varying in colour from light to dark brown, with hair which may be wavy or straight. In many parts this older Indonesian stock seems to have been absorbed by the invading Malayan stock. Among the Indo-Asians, as among the true Indians, long-headedness prevailed; the Malays, on the other hand, are mostly round-headed.

There now remains for our consideration the third of the divisions of the pigmented southern hemisphere of humanity and the fifth and last of the human population of the Old World. The Australasians are the aborigines of four separated areas:—(1) the continent of Australia, extending to almost three million square miles; (2) the great island of New Guinea; (3) the chain of islands which stretch southwards from New Guinea into the Pacific and which will be spoken of as Melanesia and their inhabitants as Melanese; (4) the island of Tasmania. I look upon the aborigines of these four lands as descendants of a common ancestral stock, their racial divergence being the result of long separation (from mid-Pleistocene times or earlier); the evolutionary changes are such as ensue in populations which are long isolated and inbred. The area of Australasia is about 3·5 million square miles; it is probable that its aboriginal population has at no time reached the million mark. Thus the Australasians form by far the smallest of the five great divisions of mankind, but for the student of human evolution they represent the most interesting and instructive of human stocks.

In all members of this stock the skin is pigmented to a varying degree; among Australian aborigines it is of some shade of brown; in the outlying lands—in New Guinea, Melanesia, and Tasmania—